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ARNOLD ARBORETUM

HARVARD UNIVERSITY

BULLETIN
OF
POPULAR INFORMATION

JAMAICA PLAIN, MASS.

APRIL 30, 1917

Effects of the Winter in the Arboretum. The effects of the heavy rainfall of the past summer and of the hot dry autumn which thoroughly ripened the wood of trees and shrubs are now shown in the generally good condition of the Arboretum collections which promise abundant crops of flowers and fruit. A few flower-buds have been killed, and there are occasionally brown leaves on Rhododendrons and other broad-leaved evergreens, but not so many as usual at this season of the year. Exotic conifers, including the new Firs, Spruces and Pines from western China, are generally uninjured but the foliage of the native White Cedar (*Chamaecyparis thyoides*) is badly disfigured. For some reason not easy to explain this tree has never taken kindly to the Arboretum conditions, and suffers here more or less every winter.

It is a late spring in eastern Massachusetts, but several plants have already flowered in the Arboretum or are now flowering here. The flowers of the White Maple (*Acer saccharinum*) have nearly passed, but those of many of the Elms are now open and have rarely been more abundant; and the Scarlet Maple (*Acer rubrum*) enlivens the landscape with its bright red flowers.

Winter-flowering Witch Hazels. The flowers of these interesting plants have never been more beautiful and abundant than this year, although they appeared much later than usual. The flowers of *Hamamelis vernalis*, the species from southern Missouri, usually open late in December and in January, and those of the Japanese and Chinese species are usually fully open in January and February; but with the

October 25, 1954

exception of a few precocious flowers on a branch of one of the plants of *H. vernalis* which opened late in December, none of these plants were in flower this year until the middle of March. In the size of the flowers and in the length and brilliancy of the bright yellow petals *Hamamelis mollis*, a native of western China, is the handsomest of all the Witch Hazels. The pale green foliage of this shapely shrub is also attractive. It is very hardy and grows rapidly, and might well find a place in any garden or city plot in public view during the winter months. This Witch Hazel is one of the most valuable and interesting shrubs brought in recent years to the United States.

Prunus Davidiana. This is the earliest of the Plum, Cherry, Peach and Apricot groups to flower this year. It is one of the wild Peaches of northern China, and is a small tree with lustrous red-brown bark, slender erect branches which form a narrow head, small flowers, narrow pointed leaves and small fruit of no edible value. The flowers are usually of the color of those of the common Peach-tree, and there is a form with pure white flowers. The two forms have been covered with flowers during the past week in the Peach and Apricot Group on the right-hand side of the Meadow Road before its junction with the Forest Hills and Bussey Hill Roads. As a flowering tree in this climate this Peach has little to recommend it for the flower-buds or the flowers are killed almost every year by late frosts, but just now pomologists in this country are interested in it as a possible stock on which to work the common Peach-tree, as it is hardy north of the region where the Peach thrives.

Early Rhododendrons. Several plants of the Siberian and north China *Rhododendron dahuricum* have been in bloom on the upper side of Azalea Path during the past week. This shrub has been in European gardens for more than a century but is still little known in the United States. It has small dark green leaves which in this climate remain on the branches until late in the winter, and small bright rose-colored flowers. These are often destroyed by spring frosts, and this plant has never been so beautiful before in the Arboretum as it is this spring. There is a variety *sempervirens* with more persistent leaves and darker-colored flowers. This variety is not blooming this year. Usually *Rhododendron mucronulatum* is the earliest of the Rhododendrons to bloom in the Arboretum but this year it is a week later than *R. dahuricum*, and is only now opening its paler rose-colored flowers. This is a tall, perfectly hardy, deciduous-leaved shrub which has flowered freely every spring in the Arboretum for the last twenty years and is chiefly valuable for the earliness of the flowers which appear on the leafless branches and are rarely injured by spring frosts. In the Arboretum the leaves turn bright yellow before falling late in the autumn. There is a large group of these plants on the lower side of Azalea Path.

Early Magnolias. The flower-buds of the Japanese *Magnolia stellata* have been nearly all killed in the Arboretum. This should not, how-

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ever, discredit this beautiful shrub, for the plants here are in low ground and in a particularly trying position, and in other Massachusetts gardens plants of this *Magnolia* have not been injured and are now in full bloom. The flower-buds of the other early-flowering Japanese species, *Magnolia kobus* and its variety *borealis*, have not been injured and are now just opening. As flowering plants they are the least desirable here of the *Magnolias* which bloom before the leaves appear, for the flowers are not large and only exceptionally are produced in large numbers.

Daphne Mezereum. A plant of the white-flowered form of this small European shrub has been in bloom on Azalea Path for the last two weeks. The purple and the white-flowered forms are useful garden plants because they are almost the first shrubs to open their flowers in this climate and because the flowers are not injured by spring frosts. This *Daphne* is interesting to us in this country because it is one of the few shrubs native of Europe which have become widely naturalized in some parts of North America, as in eastern Massachusetts and on the Canadian side of the Niagara River above the Falls.

The Cornelian Cherry, which is a Dogwood (*Cornus mas*), is one of the earliest trees or tree-like shrubs with conspicuous flowers to bloom in eastern Massachusetts. The flowers are light yellow and are borne in clusters in the axils of the unfolding leaves and, although individually small, are produced in such profusion that the branches are covered with them. The flowers are followed by bright red, lustrous, oblong fruits the size of small olives. The flower-buds and the flowers of this tree are not injured by cold. The habit of the plant is good; the foliage is dark green and abundant, and the fruit, although somewhat hidden by the leaves, is handsome. The Cornelian Cherry, which is a native of Europe and western Siberia, has been an inhabitant of gardens for more than three hundred years. In the United States it was probably more often planted in the first half of the last century than it is at present, although there are not many early-flowering trees hardy in this climate which are better worth a place in the garden. The largest specimen we know in eastern Massachusetts is in the Public Garden of Boston, near Boylston Street. In the Arboretum it may be seen with the other Dogwoods at the junction of the Meadow and Bussey Hill Roads.

Early-flowering native shrubs. Two yellow-flowered native shrubs are in flower and are well worth the attention of the makers of American gardens by whom they have been generally neglected. These are the Leatherwood, *Dirca palustris*, and the aromatic Spice Bush, *Ben-zoin aestivale*. Their leafless branches are now covered with small yellow flowers, and those of the Spice Bush will be followed in the autumn by scarlet lustrous fruits. The leaves of these plants turn yellow in the autumn before falling. Masses of these shrubs can be seen on the right-hand side of the Bussey Hill Road opposite the upper end of the Lilac Collection.

Erica carnea. In the Shrub Collection this Heath and its white-flowered variety are already in bloom. It is a common European plant which grows not more than five or six inches high but spreads into broad mats, and is the only one of the true Heaths which is really hardy in this climate. It is an excellent plant for the edging of beds and for the spring rock garden.

Alnus hirsuta. To persons who know Alders only as they grow naturally in New England these plants are small or large shrubs, but the common European Alder, *Alnus glutinosa*, is at its best a large tree; there are two large tree Alders in the Pacific states and another in Arizona and Mexico, and in Japan and eastern Siberia some of the species are trees. One of these, *Alnus hirsuta*, should be better known for it is perfectly hardy here and has grown more rapidly than any other Japanese trees raised from the seeds brought from Japan by Professor Sargent in 1892. In the Arboretum it is a shapely tree already more than thirty feet high, with smooth, lustrous pale gray bark and spreading branches, and large dark green leaves. Two plants of this Alder now in bloom can be seen on the right-hand side of the Meadow Road in front of the Linden Group. In Japan it is often a tree sixty or seventy feet tall with a trunk two feet in diameter, and there appears to be no reason why it should not grow as large in this country. Of all the tree Alders in the collection it has the most promise of long life and large size, and it should prove a good tree in the northern states to ornament the borders of streams and ponds. In Japan this tree furnishes wood used for many purposes.

The Japanese Cherry-trees in the Arboretum promise a full bloom and will be in flower in about ten days when there will be an opportunity to see here some of the most beautiful of all spring-flowering trees.

Automobiles are not admitted to the Arboretum, but visitors who desire carriages to meet them at the Forest Hills entrance can obtain them by telephoning to P. J. Brady, Jamaica 670, or to Malone & Keane, Jamaica 344.

The subscription to these Bulletins is \$1.00 per year, payable in advance.

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ARNOLD ARBORETUM

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OF
POPULAR INFORMATION

JAMAICA PLAIN, MASS.

MAY 8, 1917

The exceptionally cold and sunless weather of the last week of April and of the early days of May has greatly retarded the advance of vegetation, and very few plants are in bloom in the Arboretum; and on the 3d of May leaf-buds were still generally closed. An exception, however, is found in

Prinsepia sinensis. The leaves of this Chinese shrub, which are among the first in the Arboretum to unfold, are already nearly fully grown and the flowers are opening; these are bright yellow, about two-thirds of an inch in diameter, and appear in few-flowered clusters in the axils of the leaves. This *Prinsepia* is a tall, vigorous, perfectly hardy shrub, with ascending and spreading spiny branches, and is perfectly at home in eastern Massachusetts. It will probably prove here to be an excellent and very ornamental hedge plant. Unfortunately the red berry-like fruit is rarely produced here, so that this plant can be increased only by cuttings. The largest plant in the Arboretum is on the upper side of Hickory Path near Centre Street; a plant is also in the Shrub Collection. Another species, *Prinsepia uniflora*, a native also of northern China, is established in the Arboretum; it is a more spiny shrub with small white flowers, and as an ornamental plant has little to recommend it.

Corylopsis. A year ago attention was called in one of these Bulletins to the flowering of some of these plants in the collection of Chinese shrubs on the southern slope of Bussey Hill. The flower-buds are often injured in this climate by spring frosts but last spring they es-

caped and now these plants are again covered with flowers. *Corylopsis* is a genus of the Witch Hazel Family and is confined to the Himalayas and to China and Japan. They are shrubs with leaves which generally resemble those of the Witch Hazel and drooping spikes of fragrant clear yellow flowers. Two species discovered by Wilson in western China, *Corylopsis Veitchiana* and *C. Willmottae*, are now in bloom on Bussey Hill, and on the lower side of Hickory Path near Centre Street there is a plant of the rare Japanese *C. Gotoana* also in flower. This plant, which is not rare in central Japan, appears to be little known in gardens. The Arboretum specimen was raised here from seed collected in Japan in 1905 by Mr. Jack, and has now flowered here for several years. The flower-buds seem less liable to injury by spring frosts than those of some of the other species, and it is probable that when this beautiful shrub is better known it will become popular for the decoration of the spring garden. The flowers are of a delicate canary-yellow color and paler than those of the other species.

Rhododendron praecox, "Little Gem." This is the first of the ever-green Rhododendrons to bloom; it is a variety of *R. praecox* which is a hybrid between the Himalayan *R. ciliatum* and the Siberian *R. dahuricum* mentioned in the last issue of these Bulletins. *R. praecox* is a shrub two or three feet high with thick oval leaves bright green on the upper surface and rusty below, and few-flowered clusters of pale purple or lilac flowers which in the variety Little Gem are somewhat larger and paler in color. This variety is a handsome plant and would be a desirable ornament for the spring garden were not the flowers too often destroyed by spring frosts. This spring, as they were last year, the plants are beautifully in flower and can be seen in the Rhododendron Collection at the base of Hemlock Hill.

Prunus mandshurica. This is a hardy Apricot tree which grows vigorously in the Arboretum, and can now be seen in flower in the Peach and Apricot Group on the slope above the Meadow Road beyond the piece of natural woods. By some authors this tree is considered a variety of the common Apricot (*P. Armeniaca*) but it is very distinct from that tree in the pale bark on the stem and branches and in the shape of the leaves. The flowers which have a deep red calyx and petals faintly tinged with rose are nearly an inch across and are just now conspicuous on the leafless branches. The fruit is nearly globular, not more than an inch in diameter, yellow spotted with red, with sweet succulent flesh; it is inferior to that of cultivated forms of the common Apricot, but as *P. mandshurica* is very hardy varieties may perhaps be developed with the fruit as good as that of the best cultivated Apricots, and hardy where that tree cannot be cultivated. This Apricot as it now grows in the Arboretum is an important addition to the group of hardy ornamental early-flowering trees.

Prunus dehiscens. This little almond is now in flower in the collection of Chinese shrubs on the southern slope of Bussey Hill. It is a small, spiny, intricately branched shrub with small pale pink flowers

which open before the leaves unfold and small compressed fruit covered with hairs, with thin dry flesh splitting open at maturity. This shrub was discovered by Wilson in western China and is very similar and possibly identical with the more northern *Prunus mongolica*, which is not in the Arboretum collection. As far as it is possible to judge at this time *Prunus dehiscens* is inferior to the related *Prunus triloba* from northern China and Korea, and in its single-flowered form one of the most beautiful of all spring-flowering shrubs.

Maddenia hypoleuca. To persons who care only for plants with showy flowers *Maddenia* will have little interest, but in the Arboretum the flowering of one of these plants for the first time in America is considered a matter of some importance. *Maddenia* is a genus of shrubs or small trees found only on the Himalayas and in western China where Wilson discovered three of the five known species. *Maddenia* is related to the Choke or Rum Cherries but, unlike them, the flowers are without petals; they are borne in short clusters and consist of a green calyx tinged with red and divided at the apex into two rows of short narrow lobes, numerous stamens with slender filaments and bright yellow anthers and longer than the short style; this in some flowers is rudimentary or entirely wanting, perfect and staminate flowers often appearing in the same cluster. The fruit, like that of the other species, is small, globose, black and cherry-like. *Maddenia hypoleuca* is in the collection of Chinese shrubs on the southern slope of Bussey Hill near *Prunus dehiscens*.

Forsythias. It is three years since the Forsythias have bloomed as they are blooming this year, for last year and the year before many of the flower-buds of some of the species were killed in the Arboretum by severe winter cold. This year the flower-buds are uninjured and the flowers of many of the plants are now at their best. Those of the Servian *F. europaea*, however, will not open for a few days. Apart from the value of all the species as garden plants *Forsythia* is of special interest to gardeners for, like *Syringa* and *Philadelphus*, it is a genus whose species hybridize freely and produce new seedling forms which are often superior to the parents. The hybrid Forsythias are probably all natural, that is, they have probably all appeared without man's assistance, and those which are now known appear to have been produced by the crossing of *F. viridissima* with *F. suspensa* or its variety, *Fortunei*. The general name of these plants is *Forsythia intermedia* and there are several forms. Those in the Arboretum collection are planted at the rear of the large mass of Forsythias on the bank at the base of the Bussey Hill Road, below the Lilac Collection. The handsomest of them is *F. intermedia spectabilis*, and of all the Forsythias which have been grown in the Arboretum this is the most beautiful. The flowers are larger than those of its parents, and deep bright yellow. This plant was sent to the Arboretum from Germany several years ago. Other distinct and handsome forms of the hybrid are var. *primulina* and var. *pallida*; the former has pale primrose colored flowers and appeared as a seedling in the Arboretum a few

years ago. The var. *pallida* has pale straw-colored flowers which are paler than those of other Forsythias. The flower-buds of these hybrids appear to suffer less from extreme cold than those of either of their parents, at least in the Arboretum, and the buds of the different forms of *F. intermedia* have never been injured by cold.

Salix blanda. This is the general name for the group of hybrid Willows which has come into existence by the natural hybridization of the yellow-barked *Salix viminalis* with the Chinese Weeping Willow, *Salix babylonica*. These hybrids are large, hardy and vigorous trees, with branches as slender and pendulous as those of *Salix babylonica*. What may be considered the typical form of *S. blanda* has light olive green branches. On other forms the branches are more or less tinged with yellow. The handsomest of them has bright yellow branches, especially at this season of the year, and is still without a proper name, although it is sold in nurseries as *Salix babylonica aurea*, *S. babylonica ramulis aureis* and sometimes as *S. vitellina pendula*, although there is a weeping form of the true *S. vitellina* to which this last name belongs. The yellow-barked variety of *S. blanda* is the handsomest of the Weeping Willows which can be successfully grown in the northern states where *S. babylonica* is not always hardy. At this time with its pale yellow unfolding leaves and yellow spikes of flower-buds this tree is an object of great beauty and one of the most attractive plants in the Arboretum. *Salix blanda* is not common in the neighborhood of Boston and probably has not been much planted in any part of the United States.

It is much less well known than the hybrid of *S. babylonica* and the European *S. fragilis* for which the general name is probably *S. sepulcralis*—probably, for it is often impossible to decide what is the correct name for hybrid Willows as there is still much confusion about their origin and history. To the *S. fragilis babylonica* hybrid belong the so-called Wisconsin Weeping Willow which has been largely planted in the northern states, and is a hardy and valuable tree. Its origin is not known at the Arboretum. Thurber's Weeping Willow, named for the Massachusetts nurseryman by whom it has been distributed, is probably of the same parentage. Another hybrid known as *Salix Salamonii* is of the same parentage or is the result of the crossing of the European *Salix alba* with *S. babylonica*. This tree is highly esteemed in Europe but in this country is little known. It is a large, vigorous and hardy tree, with ascending branches and gracefully drooping branchlets, the whole forming a broad head of great beauty. This is a good time to examine the Willow Collection for many of the species, hybrids and varieties are flowering or just coming into bloom, and the flowers of Willows are often very beautiful. The Willow Collection is arranged along the northeast border of the north meadow, and is most easily reached from the Jamaica Plain entrance of the Arboretum.

ARNOLD ARBORETUM

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JAMAICA PLAIN, MASS.

MAY 14, 1917

Eastern Asiatic Cherries. During the last few years the Arboretum has been engaged in studying the Cherry-trees of eastern Asia, and has assembled a large collection of these plants, including most of the species and all the forms with double and otherwise abnormal flowers which are popular garden plants in Japan where the flowering of these trees is celebrated by national rejoicings. All the world has heard of the Japanese Cherry-blossoms, and travellers in the East usually so arrange their journeys that they can be in Tokyo when the white flowers of fifty thousand trees of the Yoshino-zakura (*Prunus yedoensis*) make a day of thanksgiving, and the great trees in the long avenue of Cherry-trees (*P. serrulata*) at Koganei are covered with their rose-colored flowers. Well known to travellers, too, are the avenues of Cherry-trees at Arashi-yama near Kyoto and at Yoshino near Nara. The Cherry-trees which mean so much to the Japanese and delight all foreigners who visit Japan in early spring are perfectly hardy, and easy to grow here in New England; and it is unfortunate that there is no hillside in the Arboretum which can be covered with these trees or no space where a long avenue of them can be planted, for the flowering of a great number of these trees might become as great a joy to the people of Boston as they are in Japan. Such collections of Cherry-trees might well form a part of the equipment for pleasure and instruction in all the northern cities of the country, but up to this time only Rochester, New York, is arranging to make a plantation of these trees to cover many acres of rolling hills in its great park on the shores of Lake Ontario. In the Arboretum only room for a few

isolated individuals has been found, but most of the species are now established here and some of them have bloomed for several years. This year the trees promise to produce an unusually large crop of flowers and a visit to them will be well repaid.

Prunus concinna. This little Cherry, which was discovered by Wilson on the mountains of central China at altitudes above the sea of from twelve to fifteen hundred feet, is the first Cherry to bloom in the Arboretum this year. In its native forests it is a shrub five or six feet tall, but here it is treelike in habit, although only three or four feet high, with a straight stem, and is now as thickly covered with flowers as it is possible for a plant to be covered. The flowers, which appear before the leaves, are in few-flowered clusters and are white with a wine-colored calyx. The red, lustrous, loose bark of the stem of this Cherry is attractive but as a flowering plant it is less valuable than the Japanese *Prunus subhirtella*, under which name it was once distributed by a London nurseryman. *Prunus concinna* can be seen in the collection of Chinese shrubs on the southern slope of Bussey Hill.

Prunus tomentosa. Until this year the earliest of the Cherries to bloom in the Arboretum, *Prunus tomentosa* is a native of China and a shrub only five or six feet high, and when fully grown in abundant space for the spread of its branches often broader than tall. The flowers open from pink buds as the leaves begin to unfold, and the bright red stalks and calyx make a handsome contrast with the white petals. The small fruit ripens in June and is scarlet, covered with short hairs, and is sweet and of good flavor. This shrub is very hardy and flourishes and produces its fruit in dry cold regions like Alberta and the Dakotas, and in such regions it is possible it may develop into an important fruit-producing plant. *Prunus tomentosa* is a native of northern China and was raised in the Arboretum twenty-five years ago from seed sent here from Peking. A form discovered in western China by Wilson (var. *endotricha*) is also established in the Arboretum. This blooms rather later than the northern plant and the fruit is destitute or nearly destitute of hairs. The white-flowered form much cultivated in Tokyo is not in the Arboretum collection.

Prunus subhirtella. This is the Japanese Spring Cherry which Mr. Wilson, after a year devoted in Japan to the study of Cherry-trees, calls "the most floriferous and perhaps the most delightful of all Japanese Cherries." It is a large, low-branched shrub rather than a tree and is not known as a wild plant. This Cherry is much planted in western Japan from northern Hondo southward, but it is not much grown in the eastern part of the Empire and is rarely found in Tokyo gardens. For this reason and as it does not reproduce itself from seed *Prunus subhirtella* is still rare in American and European collections. There are large plants in the Arboretum collection where they have been growing since 1894 and where, covered with their drooping pink flowers, they are objects of wonderful beauty. The value of *Prunus*

subhirtella is increased by the fact that the flowers often remain in good condition for ten or twelve days, and longer than those of the other single-flowered Cherry-trees. This Cherry can be raised from soft wood cuttings and by grafting on its own seedlings. These will grow into tall trees with long straight trunks (*Prunus subhirtella*, var. *ascendens*) and in Japanese temple gardens are sometimes fifty feet high with trunks two feet in diameter. This is a common tree in the forests of central Japan, and grows also in southern Korea and central China. Until Wilson's investigations in Japan in 1914 this tree seems to have been entirely unknown in western gardens. Raised from the seeds of *Prunus subhirtella*, which are produced in large quantities every year, it grows here rapidly and proves to be a handsome tree. It has the drooping flowers of the well-known *Prunus pendula* of gardens which is only a seedling form of *P. subhirtella ascendens* and for which the correct name is *Prunus subhirtella* variety *pendula*. This tree is not known to grow wild, but has for centuries decorated courtyards and temple grounds in central and northern Japan. The largest tree seen by Wilson was sixty-five feet tall with a head as broad as the height of the tree. There is a form of *P. subhirtella* (var. *autumnalis*) with semidouble flowers which blooms in both spring and autumn. This is a shrub often cultivated in Tokyo gardens, and in the Arboretum first flowered in May, 1915.

Prunus yedoensis. This is the Cherry-tree which has been most generally planted in Tokyo. It is a small tree with smooth pale gray bark, wide-spreading branches, and large pale pink or white flowers which usually open before the leaves unfold. No old trees are known in Japan, and the origin of this Cherry is uncertain. It has not been found growing wild in Japan, and Wilson after studying it in Tokyo was inclined to believe that it was a hybrid. But, whatever its origin, it is a hardy tree which produces beautiful flowers and should be better known in this country and in Europe. Last year the flower-buds were killed by the winter cold; now the Arboretum tree is covered with them.

Prunus serrulata, var. *sachalinensis*. This tree, which was called *Prunus Sargentii* until it was discovered that it had an older name, is believed to be the handsomest of the large Cherry-trees of eastern Asia. In the forests of northern Japan and Saghalin it is a tree often seventy-five feet high, with a trunk four feet in diameter; it has large pale pink or rose-colored single flowers, large dark green leaves which are deep bronze color as they unfold with the opening flower-buds, and small globose fruits which are bright red at first when fully grown and become black and lustrous when ripe. In western countries this tree was first raised in the Arboretum in 1890 from seeds sent here by Dr. William Sturgis Bigelow, of Boston, and of the trees introduced by the Arboretum there is none of greater beauty. It has been found that the seedlings of this tree are the best stock on which to graft most of the double-flowered Cherries which are so highly prized by Japanese gardeners, and that the reason why these plants have

never been successfully grown in the United States or Europe is due to the fact that Japanese gardeners do not use a suitable stock for them. Some seventy-five named varieties of these Cherries with double or otherwise abnormal flowers, cultivated in Japan, are now in the Arboretum where they are being propagated. Among them are fifteen named varieties of the Sargent Cherry, and among these are some of the most beautiful of all flowering trees hardy in this climate and evidently destined, although still little known, to become important features in American gardens. Two of the handsomest of these double-flowered varieties of the Sargent Cherry are the forms *albo-rosea* and *Fugenzo*; the former has large rose-colored flowers changing to white as they open, and the other rose-pink flowers; this is well known in English gardens under the name of *James H. Veitch*. These two Cherries differ from the other Japanese double-flowered forms in the presence of two leafy carpels in the centre of the flowers.

European and North American Cherries bloom a few days later than those from eastern Asia, and can be seen near them on the right-hand side of the Forest Hills Road from that entrance to beyond its junction with the Meadow Road.

Shad Bushes. The Arboretum will be gay with the white flowers of these plants soon after this Bulletin reaches its Boston readers. Shad Bushes have been largely used in the plantations along many of the drives, and the general collection of all species is in the border between the Meadow Road and the parallel walk on the left-hand side entering from the Jamaica Plain gateway. Two of the species are native plants in the Arboretum, *Amelanchier laevis* and *A. oblongifolia*. The first is a tree of considerable size, and an inhabitant of rich upland woods and dry banks. *A. oblongifolia* is a large shrub rather than a tree, although tree-like specimens sometimes occur. It is easily distinguished from *A. laevis* by the silver color of the young leaves which at this season of the year are thickly covered with silky hairs. The earliest of all these plants to flower, *A. canadensis*, is a tree sometimes growing to a height of fifty feet and from *A. laevis* easily distinguished by the covering of pale hairs on the lower surface of the leaves. This handsome tree is distributed from western New York to Louisiana and is the common Amelanchier of the southern states.

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JAMAICA PLAIN, MASS.

MAY 21, 1917

Plums and Apricots. Many Plum-trees are covered this year with flowers and flower-buds. The earliest of them to flower is probably a plant of *Prunus salicina*, better known as *Prunus triflora*, which was received a few years ago from a German Nursery under the name of *Prunus kurdica*, a species from central Asia with small black fruit, first known by a tree cultivated in Vienna. The German plant flowers a few days earlier than the plants of *P. salicina* raised from seeds collected by Wilson in western China, and differs from them in the lighter-colored bark of the stem and branches. It bears large yellow fruit slightly tinged with red, with thick succulent flesh of excellent quality, and seems worth the attention of pomologists in the northern states. *Prunus salicina*, which is the most important Plum-tree of eastern Asia, is best known as the origin of the so-called Japanese Plums now largely cultivated in the United States. The plants of *P. salicina* raised from Wilson's seeds are blooming well this year, and although the flowers of these trees are only about three-quarters of an inch in diameter they are so abundant that, apart from the value of their fruit, they are well worth a place in the garden for their flowers.

Prunus Simonii. This native of Northern China is blooming more abundantly this year than usual. It is conspicuous among Plum trees for the erect-growing branches which form a narrow pyramidal head. It produces red sweet fruit of fair quality, and under the name of the Apricot Plum it has been much propagated by American pomologists and largely grown in this country, especially in the Pacific States.

This tree is hardy but in the Arboretum it has been short-lived, and in this part of the country is only worth growing as a curiosity.

Prunus nigra. Among American Plums in the Arboretum collection the so-called Canada Plum, *Prunus nigra*, is the earliest to bloom. It is a native of the northern border of the United States from New Brunswick westward, and is distinguished from the more southern *Prunus americana* by its larger and earlier flowers, the blunt teeth of the leaves and by the darker and closer bark. The flowers turn pink as they fade. The Canada Plum has produced some excellent seedling forms of garden Plums like Cheney, Itasca, Aitkin and Oxford which are esteemed and largely grown by pomologists. The flowers of the Canadian Plum will soon be followed by those of *Prunus americana*, of the blue-fruited *P. alleghaniensis*, a native of southern Connecticut and western Pennsylvania, an interesting species of considerable ornamental value, of *Prunus Watsonii*, the little Sand Plum of Kansas and Oklahoma, of *Prunus Munsoniana* of the Kansas to Texas region, the wild form of the Wild Goose and many other varieties cultivated for their fruit, and of *Prunus hortulana*, a native of the region from southern Illinois to southern Missouri and Oklahoma. This is perhaps the handsomest of the American Plum trees and one of the last to flower. In cultivation it is a round-topped tree with wide-spreading branches. The flowers are small, often not more than half of an inch in diameter, and open before the leaves which are narrow, long-pointed and lustrous. The globose fruit is scarlet, very lustrous, and looks like a large cherry. Forms of this tree like Golden Beauty, Kanawha, Wayland and Cumberland, are grown and distributed by nurserymen as fruit trees; but without regard to the edible value of its fruit *Prunus hortulana* is worth a place in every northern garden for its beauty of habit, foliage and fruit. The Plum trees are planted at the entrance to the Shrub Collection from the Meadow Road, and there is a supplementary collection of young plants with many American species and varieties near the top of Peter's Hill.

Prunus dasycarpa. In the Arboretum this tree has been for many springs covered with its large showy flowers. This is the Purple or Black Apricot, so-called on account of the dull purple color of the fruit. It is a small tree with a short trunk covered with dark bark, and wide-spreading branches. A native of eastern Siberia or Manchuria, this Apricot is very hardy and is well worth cultivating in the northern states as a flowering plant, for the fruit, which has rarely ripened in the Arboretum, has little value in comparison with that of the common Apricot.

A Japanese Apricot under the name of "Mikado," a form of the common Apricot (*Prunus Armeniaca*), has been grown in the Arboretum for several years where it makes a small tree with erect branches and, flowering freely every spring, has proved here one of the handsomest and most satisfactory plants of its class.

Prunus triloba. Among the flowers of early spring few are more lovely than those of this small Almond from northern China which, in spite of the fact that it has flowered in the Arboretum every spring for the last twenty years, is still very little known, although the form with double flowers (var. *plena*) is a common garden plant in this country and is often successfully forced under glass for winter bloom. The single-flowered plant should be better known. It is a tall shrub of rather open irregular habit of growth. The flowers, which are pure clear pink in color, are produced every year in profusion, and among the shrubs introduced into cultivation by the Arboretum in the last thirty years none excel the single-flowered form of *P. triloba* in the beauty of their flowers. This shrub can be seen on the right-hand side of Forest Hills Road not far below the entrance. It can also be seen with *Prunus tomentosa* by the path leading from the Meadow Road through the woods into the Shrub Collection.

Early Lilacs. The earliest Lilacs to bloom here, the white-flowered *Syringa affinis*, and its variety with mauve-colored flowers (var. *Giraldii*), and *S. Meyeri*, are rapidly opening their flower-buds. *S. affinis* and its variety are tall shrubs of open habit and, except in their flowers, have no decorative value. The individual flowers are small but are borne in large loose clusters, and are exceedingly and pleasantly fragrant. *S. affinis* is not known as a wild plant but is the common and perhaps the only Lilac cultivated in Peking, where it has been largely used in the Imperial and Mandarin gardens. The variety is a wild plant in the region southwest of Peking. *S. Meyeri* was found in a Chinese garden by the traveller whose name it bears, and is not known as a wild plant. As it grows in the Arboretum it is a shrub beginning to flower when not more than a foot high, and covering itself with small compact clusters of small dark purple very fragrant flowers. This interesting addition to the genus *Syringa* will probably never become a popular garden plant, although it may prove useful to the hybridizer.

The Norway Maple. Only a few of the important trees of western Europe really succeed in eastern North America, although for more than a century they received more attention at the hands of American planters than our native species. There are, of course, some exceptions to this general statement. The forms of the White and of the Fragile Willow, some of the Poplars, the Beech, the Lindens, the Elms, the Birches and the Norway Maple are as much at home in southern New England and the middle states as they are in England, and probably grow here more rapidly than they do in their native countries where there is smaller although more regularly distributed rainfall and less summer heat. None of the European trees have been more generally planted in the eastern states during the last fifty years than one of the Maples (*Acer platanoides*), the so-called Norway Maple, although it is not an exclusively Scandinavian tree, but is widely spread over the continent and reaches the Caucasus. The Norway Maple has

a round-topped head and is sometimes one hundred feet high, although specimens of this size have not been produced in America. It has comparatively smooth bark, smooth pale branches, and lustrous leaves with pointed lobes which in the autumn turn clear bright yellow. The flowers, which open before the leaves, are greenish yellow, and are arranged in compact round clusters. The fruit, which is also in clusters, is smooth with horizontally spreading wings. This tree is now in bloom, and among the trees of large size which can grow in this climate only the Red Maple and some of the Willows are more conspicuous in early spring. It is not surprising that this tree has been such a favorite in the United States for it is handsome throughout the year; it bears well the hard conditions of city life, and grows better at the seashore than most of the native trees. The seedlings of few trees have shown a greater tendency to variation, and many of the varieties of the Norway Maple have been largely propagated by European nurserymen. There are a dozen of the most distinct of these varieties in the Arboretum collection, and among them are some handsome plants. The variety *columnare* is one of the best of the trees with fastigate branches although it is broader and less columnar than the form of the Sugar Maple with erect growing branches (*Acer saccharum*, var. *monumentale*). One of the handsomest of dwarf trees is the variety *globosum*, a round-topped bush branching from the ground. There is a good specimen in the Arboretum collection planted in 1888, and now about eight feet high, and broader than tall. Forms of this tree with deeply divided leaves are var. *dissecta* and var. *cucullata*, the Eagle Claw Maple. These are small trees which are more curious than beautiful. The most popular of the varieties of the Norway Maple is the variety *Schwedleri*. Early in the season this tree has bright red leaves which before summer are dark dull green. The color of the spring leaves attracts nurserymen, and this tree has been planted largely in the neighborhood of eastern cities. The dull unnatural color of the mature leaves makes this, however, an undesirable tree for general planting. More attractive is the variety *Stollii* with large three-lobed leaves, purple as they unfold but later dark green. This is one of the most distinct of all the forms of the Norway Maple in the Arboretum collection.

The Sugar Maple (*Acer saccharum*) is also in bloom and, although the flowers do not make so much show as those of the Norway Maple, as they are paler in color and arranged in drooping clusters, they are more delicate and better worth close inspection by the lovers of beautiful flowers.

An illustrated guide to the Arboretum containing a map showing the position of the different groups of plants has been published. It will be found useful to persons unfamiliar with the Arboretum. Copies of this guide can be obtained at the Administration Building in the Arboretum, from the Secretary of the Massachusetts Horticultural Society, 300 Massachusetts Avenue, Boston, from The Houghton, Mifflin Company, 4 Park Street, Boston, and at the office of the Harvard Alumni Bulletin, 18 Plympton Street, Cambridge. Price, 30 cents.

ARNOLD ARBORETUM
HARVARD UNIVERSITYBULLETIN
OF
POPULAR INFORMATION

JAMAICA PLAIN, MASS.

MAY 28, 1917

Crab-apples. These plants for the decoration of northern gardens are of first-rate importance, and from its early days much attention has been paid at the Arboretum to the collection and study of the different species, hybrids and varieties. The flowering of the Crab-apples is one of the important Arboretum events and, although the season is ten or twelve days late, some of the Asiatic species are already in bloom and during three or four weeks Apple blossoms can be seen here.

From the Crab-apple of southeastern Europe and western and central Asia (*Malus pumila*) most of the Apples of our orchards have been developed, although in some of these the blood of the Crab of northern and central Europe (*Malus sylvestris*) can be traced. The Paradise Apple is a very dwarf form of *Malus pumila* used by nurserymen as a stock for dwarf pomological varieties. The first of the Crab-apples of eastern Asia known to Europeans (*Malus baccata*) was first cultivated in Europe one hundred and thirty years ago. It is a native of eastern Siberia, and is a tall, narrow tree with large white flowers appearing with the leaves, and fruit the size of a large pea. The Siberian Crab, as it is popularly called, is a handsome, very hardy plant; its great value, however, is that, crossed with the cultivated Apple-tree, it has given rise to a race of Apples like the Hyslop and the Transcendent Crabs which can be grown in regions too cold for the successful cultivation of the ordinary Apple. These hybrids are known as Siberian Crabs, and many named varieties can now be found in nurseries in the extreme northern part of the country. They

are fast-growing, erect and shapely trees, and well worth a place in northern gardens for the beauty of their flowers and brilliant scarlet or yellow fruits which are usually oblong or ovate in shape and from an inch to an inch and a half in length. The fruit is acid but makes excellent jellies and preserves for which it is largely used. *Malus baccata* has been used in cold regions as a stock on which to graft the ordinary Apple, but its liability to the blight which attacks Pear-trees reduces its value for this purpose. The largest specimen of *Malus baccata* in the neighborhood of Boston is standing in front of the gardener's house in the Harvard Botanic Garden in Cambridge.

One of the handsomest of the Crab-apples in the Arboretum collection is a Korean variety of *Malus baccata* which has been distinguished as var. *Jackii*. It was raised here in 1905 from seed collected by Mr. Jack near Seoul. The plants, although still small, are shapely in habit with straight clean stems and regularly spaced spreading branches; the leaves are thick, long-stalked, from four to six inches in length, dark dull green above and pale below; the flowers are pure white and nearly two inches in diameter, and the dark crimson shining fruits, which are often half an inch long, hang gracefully on long drooping stems. A widely distributed form of *Malus baccata*, the var. *mandshurica*, differs in its broader, more or less hairy leaves. This tree is distributed from the Amoor region to western China and Japan where it is common northward, and in Hokkaido is often found in Alder woods in the neighborhood of the coast.

Malus prunifolia. In one of its forms (var. *rinki*) this tree has been the most economically valuable of all the Asiatic Apple-trees. *Malus prunifolia*, although it has been known in western gardens for many years, is still unknown as a wild plant, but Wilson found growing wild its variety *rinki* in central and western China. This variety differs from *Malus prunifolia* in the shape of the leaves and the amount of their hairy covering, and in the shape and color of the fruit which varies from greenish yellow to yellow or red. This is the Apple which has been cultivated by the Chinese probably for centuries. The fruit of the cultivated tree seen by Wilson was rarely more than an inch and a quarter in diameter, green or greenish yellow with a rosy cheek, or sometimes almost entirely red and had a pleasant bitter-sweet flavor. He found that the fruit grown in the cold region near the Tibetan border was of better quality than that produced in the warmer regions further east. Until the coming of foreigners into Japan introduced American and European varieties of Apples the var. *rinki* was a commonly cultivated fruit tree in Hondo, although now it has almost entirely disappeared from Japan.

Only the Apples already mentioned, *Malus sylvestris* of western and northern Europe, *M. pumila* of southeastern Europe and western and central Asia, *M. baccata* of eastern Siberia, *M. prunifolia*, var. *rinki* of western China, and the species of eastern North America are of economic importance to man. The fruits of the last are sometimes

used domestically in making jellies and preserves but are not in very general use. All the other Crab-apples are only valuable for the beauty of their flowers and fruits in the decoration of gardens. The American Crab-apples bloom later than the Old World species, and their flowers do not open until the leaves are well grown. The flowers are more or less deeply tinged with pink or rose color and are exceedingly fragrant. The fruits of the eastern species are depressed-globose, light green, sometimes turning pale yellow when fully ripe, lustrous, covered with a waxy exudation, and more fragrant than the fruit of other Apple-trees. The fruit falls without having become soft, and remains on the ground a long time without losing its shape. The fruit of the northwestern species (*M. fusca*) is oblong, not more than three-quarters of an inch in length, yellow-green or yellow often flushed with red, or occasionally entirely red. The flesh of this little apple is thin and dry.

The American Crab-apples are good plants for wood borders and forest glades, and can be used to advantage with the Flowering Dogwood (*Cornus florida*), the different Shad Bushes (*Amelanchier*), and some of the American Hawthorns to enliven forest parks and country roadsides. American Crab-apples, however, are still little known or appreciated by American gardeners, and only one of them, the so-called Bechtel Crab, a double-flowered form of *M. ioensis* of the Mississippi Valley, is found in American nurseries. The flowers of this tree resemble small double pink roses and attract more attention than almost any other plant in the Arboretum. Among the handsomest of the species of eastern Asia as flowering plants are:—

Malus floribunda is probably the best known and the most generally cultivated Crab-apple in this part of the country. When grown naturally it is a broad, tall, round-topped bush, rather than a tree, with wide-spreading branches. The flowers as they open are red and, passing through different shades of rose color, become almost white before the petals fall. The fruit is not much larger than a pea. This plant is one of the most satisfactory of all flowering shrubs which can be grown in this climate for it has never yet been injured by cold, heat, or drought, and never fails to produce its flowers every spring. On some of these plants the fruit drops in early autumn, and on other seedling plants raised in the Arboretum it remains on the branches until early spring and furnishes birds with great supplies of winter food, and for the benefit of the birds plants of this variety should be selected. There are a number of these plants close to the Administration Building where during the winter they are much frequented by pheasants who find shelter in a neighboring Pine grove. A hybrid of *Malus floribunda*, and one of the hybrid forms of *M. baccata* appeared spontaneously in the Arboretum, and has been called *Malus Arnoldiana*; it has the low-branched habit of *M. floribunda* but the flowers and fruits are more than a third larger. This is one of the handsomest of all Crab-apples.

Other Crab-apples to which special attention is called are:—*Malus Halliana*, var. *Parkmanii*, the double-flowered form of a Chinese tree, long cultivated by the Japanese and introduced into this country from Japan more than forty years ago. The bright rose-colored flowers hang on long slender stems and differ in color from those of any other Crab-apple; *Malus Sargentii*, a shrub from northern Japan with wide-spreading branches, pure white flowers with bright yellow anthers, and scarlet fruit which remains on the branches until spring and appears to be unpalatable to birds; *M. Sieboldii*, a Japanese plant better known perhaps under the incorrect name of *M. toringo*, and the last of the Asiatic species in the collection to bloom. There are both shrubby and arborescent forms of this plant which has small nearly white flowers produced in immense quantities and minute fruit which is bright red on some individuals and yellow on others. The variety *callicarpa* of this species is one of the handsomest of the Crab-apples in the collection both in spring and autumn. It is a broad tree-like shrub or small tree with slightly lobed leaves, pink and white flowers an inch in diameter, and brilliant scarlet, lustrous fruits which are half an inch in diameter and are more beautiful perhaps than those of any other Crab-apple. This beautiful plant is little known in gardens and was raised in the Arboretum from seed presented in 1890 by Dr. William Sturgis Bigelow, of Boston. It is impossible in one of these bulletins to more than mention a few of the most important plants in this group, but something will be said of others as they begin to flower. The old Crab-apple Collection is on the left-hand side of the Forest Hills Road next to the group of wild Pear-trees, and a much larger and more complete collection is at the eastern base of Peter's Hill.

Rhododendron (Azalea) poukhanense. Another year adds to the good opinion we have of this plant at the Arboretum, for New England winters have no bad effects on it and it is blooming on Azalea Path more freely perhaps than ever this spring. This low, compact, round-topped Korean shrub is well suited for the decoration of the rock garden and to use in small beds or borders. The large rose-pink flowers are unusually fragrant among those of plants of this class.

Pyrus Calleryana. This Pear-tree, which is widely distributed in central China, is flowering well for the first time in the Arboretum, and can be seen in the new collection of Chinese trees of the Rose Family on the southern slope of Bussey Hill. The flowers are smaller than those of *Pyrus Bretschneideri* and *P. ovoidea*, Chinese Pear-trees now in flower in the old Pear Group on the Forest Hills Road, and the small fruit is of no value. This may be a really valuable tree, however, as some American Pomologists are of the opinion that it may prove a blight resisting stock on which to graft garden varieties of the Pear. As the Arboretum plants are the only ones in America large enough to bloom it will require several years to obtain plants enough thoroughly to test its value for this purpose.

ARNOLD ARBORETUM

HARVARD UNIVERSITY

BULLETIN
OF
POPULAR INFORMATION

JAMAICA PLAIN, MASS.

JUNE 1, 1917

Lilacs. The Lilac of old gardens with its purple or white fragrant flowers, hardy, long-lived, easily increased by shoots from the roots, resistant to all sorts of climate, known to every boy and girl brought up in the country, is in New England what "The May" (*Crataegus*) is in Old England, the best loved of all shrubs. It is loved but not respected. No one hesitates to break down a Lilac-bush for the flowers. Without the protection of special policemen the Arboretum Lilacs would be exterminated in a day. It is impossible to protect Lilac flowers in public parks and city squares, and every year city hawkers in search of them extend their depredations further into the suburbs; and in Lilac season automobiles loaded with stolen mutilated Lilac branches covered with wilted flowers are common objects along all the roads leading into Boston.

The first Lilac to get a place in European gardens was the plant which only slightly modified is still to be found growing in the neighborhood of many old New England farm-houses. This plant (*Syringa vulgaris*) reached western Europe in 1597 by the way of Constantinople and Vienna. It was long believed to have come originally from Persia and it is only in comparatively recent years that it has been known that this Lilac was a native of the mountain forests of Bulgaria. Plants raised at the Arboretum from seeds of the wild Bulgarian plants are growing with the other Lilacs in the collection, and it is interesting to compare the flowers of the wild type with those which cultivators have produced in the last half century. Another Lilac, the so-called Persian Lilac (*Syringa persica*), a native of the region from

the Caucasus to Afghanistan, was known in England as early as 1658. This is a smaller plant than the common Lilac, with slender stems, narrower leaves, and smaller but very fragrant flowers. The flowers are pale lilac color but there is a form with nearly white flowers, and one on which the leaves are deeply divided (var. *laciniata*). The Persian Lilac blooms usually ten days later than the common Lilac and is a beautiful garden plant, but is probably less often cultivated than it was a century ago. It is of particular interest, however, as one of the parents of the first hybrid Lilac, the other being *Syringa vulgaris*. This hybrid appeared in the Botanic Garden at Rouen, France, early in the nineteenth century and through a mistaken idea of its origin was named *Syringa chinensis*. It is sometimes called *Syringa rothomagensis*. This hybrid is one of the most valuable of all Lilacs. It grows quickly to a large size; it is very hardy and blooms freely every year. In shape the leaves resemble those of the Persian Lilac but are broader; the flowers, too, recall those of the Persian Lilac, but they are larger and are produced in long massive clusters sometimes nearly two feet in length, and so heavy that the slender branches do not well support them. The flowers are reddish purple but there are forms with darker red flowers and with nearly white flowers.

In a recent issue of *The Garden Magazine*, Mr. Theodore A. Have-meyer describes the development of the modern Lilacs, which, according to him, date from 1843, no mention in his paper being made of *Syringa chinensis*. In 1843 a nurseryman at Liege, in Belgium, produced a Lilac with small double flowers. Nothing is said of its parentage, but as it was called *Syringa vulgaris flore pleno Liberti*, and later *Syringa vulgaris azurea plena*, it was probably a seedling of the common Lilac and not a hybrid. This plant is not in the Arboretum collection, and if it is known to any reader of this Bulletin the Arboretum will be glad to hear from him, for although it probably has little to recommend it as an ornamental plant this Lilac has historical interest and for that reason should find a place in the Arboretum collection. It was this plant that Lemoine, the French hybridizer, selected as the seed-bearing parent in his first attempt to improve the garden Lilacs, fertilizing the flowers with pollen of the handsomest varieties of the common Lilac of that day and of a Chinese species, *Syringa oblata*, which had been found by Fortune in a Shanghai garden and sent by him to England nearly sixty years ago. This Chinese Lilac is distinguished from all other Lilacs by the broad, thick, lustrous leaves which turn deep wine color in the autumn. The flowers are light lilac color, exceptionally fragrant, and are borne in short, compact clusters. This is one of the earliest Lilacs to bloom here, but unfortunately the flower-buds are often injured or destroyed by late frosts. For this reason, although the flowers are not surpassed in color and fragrance by those of many Lilacs, this plant cannot be recommended for general cultivation in this part of the country.

The crossing of *Syringa oblata* and *S. vulgaris azurea plena* produced a plant which has been called *Syringa hyacinthiflora*. This is a vigorous shapely shrub with leaves the shape of those of its Chinese par-

ent, which turns reddish in autumn but without the brilliant colors of the Chinese plant. The flowers are small and double, in small clusters, bluish lilac and as fragrant as those of *S. oblata*. This plant is interesting as the second of the four species-hybrids of Lilacs which are now known, and valuable for its very early fragrant flowers. It has probably played, too, an important part in the improvement of the double-flowered forms of the common Lilac which have been produced in recent years by Lemoine and other European nurserymen. *Syringa hyacinthiflora* is not often found in American gardens, but it is well established in the Arboretum collection.

By fertilizing the flowers of *Syringa vulgaris azurea plena* with the varieties of the common Lilac Lemoine produced the first important double-flowered Lilacs, *S. Lemoinei* and others, and by again crossing these with improved forms of the common Lilac the double-flowered Lilacs of recent years have been made. By the crossing of varieties and by careful selection the flowers of the common Lilac have been gradually changed in size and in color in the last thirty years, but unfortunately the flowers of some modern Lilacs have lost a good deal of the fragrance of the old-fashioned Lilac, which, once enjoyed, is never forgotten. There are too many varieties of the common Lilac now cultivated. Some of them with different names given to seedlings in different nurseries and often in different countries are identical, and others are so much alike that they can only be distinguished by close comparison. There are more than two hundred of these named varieties of *Syringa vulgaris* now in cultivation. It is important to cultivate them all in the Arboretum for study and comparison, but in a private garden everything that is best in the forms of *Syringa vulgaris* can be found in not over a dozen of the single-flowered and a dozen of the double-flowered forms. The Arboretum does not undertake to name the twenty-four best varieties. The selection must be left to the person who is going to plant them, for no two persons agree about Lilac flowers. There are between one hundred and sixty and one hundred and seventy named varieties of this Lilac in the Arboretum collection. The flowers are fast-opening, and the best way for persons living in the neighborhood of Boston to make their selection is to study the Arboretum collection, and make notes on the color and size of the flowers and the size and shape of the flower-clusters.

In planting Lilacs it must be remembered that plants on their own roots are superior to those which have been grafted on other varieties of the common Lilac, for Lilacs produce many root-suckers. These often grow vigorously, so that a person who buys a fine named variety may in a few years find that the suckers from the root on which it was grafted have overpowered and killed his named variety, or that he has a bush producing on different branches flowers of his original purchase and of the stock. Nurserymen also use the Privet as a stock on which to graft Lilacs. But Lilacs should never be grafted. Although they can be propagated in winter by cuttings of hard wood, the best way is to make soft wood cuttings in late June or early July. American

nurserymen rarely adopt this method for it takes a little longer to produce saleable plants than it does by grafting, but the plants on their own roots are so much more valuable than grafted plants that no one should ever buy a grafted Lilac.

Syringa pinnatifolia is one of the Lilacs discovered by Wilson in western China which has flowered this year for the first time in the Arboretum. The small nearly white flowers in small short clusters opened ten days ago; they are less beautiful than those of almost any other Lilac, but the plant is of considerable interest, as it is the only Lilac with pinnate leaves. It is with the other Chinese Lilacs on the path at the top of the bank on the left-hand side of the Bussey Hill Road occupied by the Lilac Collection.

Rhododendron (Azalea) Kaempferi. Plants of this handsome red-flowered Japanese Azalea on Azalea Path where they are fully exposed to the sun have been in flower for a week, although plants in the shade on the northern side of Hemlock Hill will not open their flowers for several days. The flowers are very delicate and are easily injured by the sun, and it is best to plant this shrub among trees in partial shade or on the northern side of conifers. This Azalea has been growing in the Arboretum for more than twenty years and is perfectly hardy in eastern Massachusetts. Late in May or early in June no other shrub makes a more brilliant show of color.

Buckeyes. The first of the Horsechestnuts, or Buckeyes as the species of eastern North America are called, to flower this year is the form of the Ohio Buckeye (*Aesculus glabra*) from northwestern Missouri, the variety *Buckleyi* with leaves composed of seven instead of five leaflets. It was followed in a few days by the flowers of the normal tree. The Ohio Buckeye is a comparatively small tree which begins to flower when less than ten feet high, and the clusters of small yellow or greenish yellow flowers are not showy. It is interesting as the only American species with prickly fruit like that of the Old World Horsechestnuts. Different Buckeyes and Horsechestnuts will be in bloom for several weeks and among them are some of the handsomest of flowering trees. The Aesculus Collection is a large one and has been arranged next to the Lindens on the right-hand side of the Meadow Road.

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BULLETIN
OF
POPULAR INFORMATION

JAMAICA PLAIN, MASS.

JUNE 9, 1917

Double-flowered Cherries. Small plants covered with flowers of two of the handsomest of the double-flowered Japanese Cherries can be seen in the Cherry Collection on the right-hand side of the Forest Hills Road. They are varieties of *Prunus serrulata*, var. *sachalinensis*, the so-called Sargent Cherry, and are named *fugenzo* and *albo-rosea*. The first has rose-pink flowers and bronze-colored young leaves, and is believed to be one of the most beautiful of all double-flowered Cherries. This plant has become common in English gardens under the name of "James H. Veitch." In Japan it is called "kofugen" or "benifugen." The form *albo-rosea* has pink flower-buds which become white as the flowers open. Like those of the form *fugenzo* the flowers have two green leafy carpels in the centre and these distinguish these two varieties from all the other Japanese double-flowered Cherries. There are twelve other double-flowered forms of the Sargent Cherry among the seventy-five varieties of different species of Cherries cultivated by the Japanese for the beauty of their flowers and introduced into the Arboretum by Wilson two years ago. In the last fifty years many attempts have been made to cultivate some of these plants in the United States and Europe but with no great success, and they are now imported in considerable numbers every year into the United States from Japanese nurseries. Such plants, however, are short-lived and unsatisfactory, and from studies of these Cherries in Japan Mr. Wilson became convinced that it was the stock on which they were worked in Japan as well as in the United States and Europe that was the cause of their failure, and that the only hardy, long-lived reliable stock for them was the wild type of the Sargent Cherry. If his con-

clusions are correct, there seems no reason why these double-flowered forms should not grow here to be large and long-lived trees. The double-flowered Japanese Cherries bloom later than the trees with single flowers and in normal seasons just before or with the Lilacs; they remain in flower for several days, and if they prove really successful when the proper stock is used on which to graft them the beauty and interest of the spring gardens of the United States will be greatly increased.

Rhododendron (Azalea) japonicum. This Azalea, although the flowers are less brilliant than those of the now better known *R. (Azalea) Kaempferi*, is probably the handsomest of the hardy Azaleas of eastern Asia. The flowers are flame color and rather more than three inches in diameter. As it grows here this Azalea is a round-topped, rather compact, hardy shrub blooming freely every year. It was raised at the Arboretum from seeds collected in Japan by Professor Sargent in 1892 and has been growing in the Arboretum as long as *R. Kaempferi*. Long confused here with the *Azalea mollis* of gardens, less attention has been paid to it, and it is only recently that its specific characters and value have been understood. One of the parents of the hybrid *A. mollis* of gardens it is a handsomer, longer-lived, and more satisfactory plant than that popular and well-known Azalea. In gardens *Rhododendron japonicum* is still one of the rarest of all the hardy Azaleas. It is now in bloom on the lower side of Azalea Path where there is a group of large and small plants.

An early-flowering Hawthorn. The first Hawthorn to bloom in the Arboretum every year is *Crataegus nigra*, a native of southeastern Europe. The Arboretum specimen is a shapely tree from fifteen to eighteen feet high, with a broad compact head and a well-formed trunk covered with pale scaly bark. The leaves are broad, deeply-lobed, covered below with soft hairs, and grayish green in color. The flowers are hardly more than half an inch in diameter, with twenty stamens and anthers faintly tinged with rose, and are borne in small compact clusters. As the flowers fade the petals turn rose color. As a flowering tree *Crataegus nigra* is less beautiful than many of the American Thorns, but the black and lustrous fruit is unusual in color among Thorn trees. The color of the fruit and the earliness of the flowers make this an interesting addition, however, to the list of small trees with showy flowers which can be successfully cultivated in Massachusetts.

A few American Thorns. Several of the early large-flowered American Thorns have been in bloom for several days and are conspicuous and beautiful objects. Among them may be mentioned *Crataegus Arnoldiana*, *C. Ellwangeriana*, *C. pedicellata* and *C. coccinioides*. *C. Arnoldiana* is easily distinguished even in winter by its conspicuously zigzag branchlets armed with long straight thorns; the flowers with their ten stamens and yellow anthers are in broad, many-flowered clusters, and late in August, when the trees are covered with their bright scarlet fruit dotted with white and three-quarters of an inch in diameter, they are more beautiful even than at the end of May. On account of its early ripening and showy fruit this is one of the best of the American Hawthorns for the decoration of summer gardens. *C. Ellwangeriana* is common in the neighborhood of Rochester, N. Y.,

and ranges into Pennsylvania, Ontario and Michigan. It is a tree sometimes twenty feet tall with wide-spreading horizontal branches and a tall trunk often a foot in diameter, flowers an inch across with ten stamens and rose-colored anthers, and large oblong scarlet fruit ripening and falling at the end of September or early in October. *C. pedicellata* is one of the commonest arborescent species in the western New York-Ontario region, and is often twenty feet high with a tall trunk and ascending and spreading branches. The flowers are half an inch in diameter with ten stamens and rose-colored anthers, and the large oblong fruit is bright scarlet. *C. coccinioides* is distinct in its very compact, few-flowered, nearly globose clusters of large flowers with twenty stamens and large, dark rose-colored anthers. The fruit, which ripens early in October and falls gradually during a month or six weeks, is subglobose, much flattened at the ends, slightly angled, bright scarlet and nearly an inch in diameter. *C. coccinioides* is a native of the region in the neighborhood of St. Louis, Missouri, and is one of the handsomest and most distinct of American Thorns. Many other young Thorn trees are now in bloom in the new Crataegus plantation on the eastern slope of Peter's Hill, and during the next four or five weeks there will be an opportunity to examine there the flowers of three or four hundred species of these plants.

Cotoneaster multiflora, var. calocarpa. This is the first of the new Chinese Cotoneasters to flower this year. It is a shrub with slender gracefully arching stems and narrow blue-green leaves. The arching of the stems brings the flowers, which are borne in erect clusters on short lateral branches, into a conspicuous position and there is now in the Arboretum no shrub in bloom more graceful in habit or more charming in the arrangement of its flowers. The fruit of this species is dull red and about one quarter of an inch in diameter. This plant can be seen in the large collection of Chinese Cotoneasters on the southern slope of Bussey Hill. It is now well worth examination, as are all the species in this group, for among them are some of the most beautiful of all shrubs of recent introduction.

Malus theifera. This Crab-apple, which was introduced by Wilson from western China, is flowering this year in the Arboretum for the third time and gives every promise here of increasing the number of trees with beautiful flowers which can be grown successfully in this climate. In habit this Crab-apple differs from all others in its stiff, wide-spreading and slightly ascending branches which make an unusually open head. The flowers are light pink and about three-quarters of an inch in diameter, and when they cover the branches the plants look like Cherry-trees rather than Apple-trees. The fruit ripens in October and is yellowish green or red and about a quarter of an inch in diameter. The name *theifera* has been given to this plant as the Chinese living on the mountains in central and western China use the dried leaves as a substitute for tea. The best plant of this beautiful little tree in the Arboretum is in the collection at the base of Peter's Hill.

Magnolia Fraseri. This is the first of the American Magnolias to bloom in the Arboretum and has now been in flower for several days. It is a small tree rarely more than forty feet high with an open head of long branches, leaves often a foot in length and deeply divided at the base, and creamy-white, sweet-scented flowers eight or ten inches

in diameter and very conspicuous, as they stand well above the ends of the branches. This Magnolia is a native of the southern Appalachian region, and, although it has not been found yet growing naturally north of southwestern Virginia, it is perfectly hardy in eastern Massachusetts. The flowers of the Cucumber-tree, *M. acuminata*, and of *M. cordata* soon follow and are already beginning to open. The American Magnolias were once highly prized, especially in Europe, as ornamental trees, but, with the exception of *M. macrophylla* and *M. acuminata*, they are now difficult to find in American nurseries, although as a group few trees are better worth a place in northern parks and gardens. The American Magnolias are on the right hand side and close to the Jamaica Plain entrance.

Syringa pubescens. Attention is called again to this Lilac from northern China, for it is still too little known, although some persons who know it best consider that it is better worth a place in the garden than any other species or variety of Lilac. It is a native of northern China, and is a tall shrub with erect stems, small leaves, and broad clusters of pale lilac-colored flowers remarkable for the long tube of the corolla and for their delicate fragrance. For this fragrance, if for no other reason, this Lilac should find a place in every northern garden. The plant in the Arboretum collection is now covered with opening flowers.

Prunus Padus, var. commutata. This variety of the Old World Bird Cherry is probably a native of eastern Siberia or Manchuria, and is interesting in the fact that it puts forth its leaves ten or twelve days earlier than any other tree in eastern Massachusetts. It blooms, too, two weeks earlier than the American or the other Old World Bird Cherries. The pure white flowers are borne in long pendant racemes and are exceedingly fragrant. The fruit is not known here. The seed from which this plant was raised was sent from the Botanic Garden at Petrograd in 1878, incorrectly named *Prunus Maackii*, under which name the young plants were distributed from the Arboretum, and as *Prunus Maackii* it is still cultivated and much esteemed in some Illinois gardens. *Prunus Padus, var. commutata*, has also been cultivated in this country under the name of *Prunus Grayana* which is a Japanese Bird Cherry still rarely found in American gardens. It is one of the hand-somest arborescent shrubs or small trees of its class; it grows with remarkable rapidity, is perfectly hardy and never fails to produce great crops of flowers. Although the early leaves have never been injured here, in regions where severe spring frosts prevail they might be destroyed.

Prunus Maackii. The true *Prunus Maackii* is in bloom. It is a tree with a well-formed trunk covered with bright orange-colored bark separating readily into thin plates, short erect clusters of small white flowers, and small black fruit. The only interesting things about this tree are its Birch-like bark which differs from that of any other Bird Cherry and its rarity in gardens. It can be seen near the entrance to the Shrub Collection at the Forest Hills Gate. There are other specimens in the mixed plantation near the top of Peter's Hill.

ARNOLD ARBORETUM

HARVARD UNIVERSITY



BULLETIN

OF

POPULAR INFORMATION

JAMAICA PLAIN, MASS.

JUNE 15, 1917

Wisterias. All the species and varieties of *Wisteria* have now been arranged on the trellis near the Forest Hills Road with the exception of the white-flowered form of *W. sinensis*, *W. japonica* and the double-flowered form of *W. venusta*. The first appears to be an exceedingly rare plant; it was found by Fortune in Chinese gardens and first flowered in England in 1849, and Wilson saw occasional plants on the cliffs near Ichang in central China. This plant has never been in the Arboretum. There was a plant in Francis Parkman's garden in Jamaica Plain which flowered in 1880 but has now disappeared; there is said to be a specimen in a garden in Connecticut, and there are two splendid old plants in gardens in Opelousas, Louisiana. It is wanted for the Arboretum collection. *Wisteria japonica* is a smaller plant than the other Asiatic species, with slender stems and small clusters of pale yellow flowers. This plant flowered in the Dana collection at Dosoris, Long Island, in 1879, and once many years ago produced a few flowers in the Arboretum. It is a native of the warmer parts of Japan, and not really hardy in the northern states.

There are two American species native of the middle and southern states; the best known of these, *Wisteria frutescens*, is the more northern plant and is a slender vine with short compact clusters of comparatively small fragrant flowers. It is a less showy plant than the other species but is interesting as the first of the *Wisterias* cultivated in the United States and Europe. There is a white-flowered variety (var. *alba*). A handsomer plant is *Wisteria macrostachya* from the Missouri-Louisiana-Texas region but fortunately perfectly hardy

in Massachusetts. It has much larger flowers in longer racemes than the other American species from which it can be distinguished by its longer calyx-lobes and by the glandular hairs on the calyx and flower-stalks. A fine form of this plant was once common in gardens under the name of *Wisteria magnifica* which has often been incorrectly considered a variety of *W. frutescens*. Another form with blue and white flowers has been described under the name of var. *albo-lilacina*. *W. macrostachya*, although the flowers are less showy than those of the Asiatic species, is a beautiful plant which is too little known in gardens. The American Wisterias bloom later than the Asiatic species and prolong the Wisteria season for several weeks.

Wisteria venusta. The earliest of the Wisterias to flower is *W. venusta*, and although this plant had been sent to the United States and Europe for several years by Japanese nurserymen, nothing was really known about it until Wilson's visit to Japan in 1914 when he found that it was a distinct and undescribed species distinguished by broad clusters, not more than six inches long, of very large flowers on stems an inch and a quarter in length and by the soft hairs which cover the lower surface of the leaves through the season. This plant, although it has long been grown in Japanese gardens where there are very large specimens, is not Japanese, and it is now believed to be an albino form of the blue-flowered Wisteria which is cultivated in Peking and other gardens of northern China but which has not yet been described by botanists or brought to this country. If this opinion of the origin of *W. venusta* is correct it should prove harder than any of the other Asiatic Wisterias and perhaps make it possible to extend much further northward the successful cultivation of these plants. The flower-buds of *W. venusta* are well developed in the autumn and it is the easiest of all Wisterias to bring into bloom in the winter by artificial heat. There is a form with double flowers (var. *plena*) which is occasionally cultivated by Japanese florists and is known in England.

Wisteria sinensis grows naturally in central and southern China, and is the common Wisteria in the gardens of the United States and one of the most vigorous of the hardy climbing plants of the northern hemisphere. In New England country gardens the flower-buds are often killed by cold, and it grows better on city houses where it is more protected than in the country. In the southern states, where it often grows to the tops of trees more than a hundred feet high, and in California it is seen in its greatest magnificence. The white-flowered form is the only variety of this plant which has yet been found.

Wisteria floribunda. This is the common Japanese Wisteria and is found growing naturally only in the central and southern parts of that country. It has smaller and more fragrant flowers in narrower and more open clusters than the Chinese plant, and blooms here ten or twelve days later. This Wisteria is one of the most generally cultivated garden plants in Japan, and Wilson found in a garden at Kasukabe a plant which extended over a bamboo arbor one-sixth of an acre in extent and was covered with flower-clusters which measured up to sixty-four inches in length. This garden form with the long clusters has been distinguished as variety *macrobotrys*. On wild plants the flower-clusters are sometimes not more than ten inches long, and in

their length this plant varies greatly. There is a beautiful form with pure white flowers (var. *alba*) which is becoming common in this country, another with flowers which are pure pink or white more or less tinged with pink (var. *rosea*), and another with leaves blotched with yellow (var. *variegata*). There is also a double-flowered form (var. *violacea plena*) which was first sent to this country in 1862 and first flowered here in the garden of Francis Parkman at Jamaica Plain. Fortunately this form blooms very rarely, for the flowers are ugly, something which cannot be said of any other Wisteria. Although the Japanese Wisteria is usually called *W. multijuga* in gardens, the oldest and correct name for it is *W. floribunda*.

Early-flowering Diervillas or Weigelas. The earliest of these plants to flower in the Arboretum, and perhaps the handsomest of all the species, varieties and hybrids of Diervilla known in gardens, is the Korean form of *D. florida* discovered and introduced by Mr. Jack to which the varietal name *venusta* has been given. It is already a shrub here five feet tall and three or four feet through, and every spring is completely covered with dense clusters of rosy-pink flowers from an inch and a half to two inches in length. It is perfectly hardy, which cannot be said of all the garden Weigelas; it grows rapidly, and no shrub can bear larger crops of flowers. There is a plant now in full bloom on Hickory Path near the Pecan tree, and another in the Shrub Collection at the end of the Diervilla Collection near the Cherry-trees.

Diervilla praecox. This name has been given to an early-flowering plant which has been sent from Japan to Europe but is not a native of Japan and is not known in its wild state, although it is probably a form of *Diervilla florida* from northern China. In the hands of Lemoine, the French hybridizer, a number of beautiful hybrids or varieties have been produced and are now in flower in the Shrub Collection. Among the handsomest of these are Seduction with red flowers, Espérance with pink flowers, Avant Garde with pale rose flowers, Vestale with white flowers, Gracieux with pink and white flowers, Floreal with rose-colored flowers, Conquérant with rose-colored flowers, and Fleur de Mai with pink flowers. These are less known but hardier and better garden plants here than many of the hybrid Weigelas more commonly cultivated.

Rosa Hugonis. Judging by its appearance this year, no plant sent from China to our northern gardens equals this Rose in grace and beauty. The long gracefully arching branches are so thickly covered with flowers from end to end that the petals touch and make a continuous band of pale yellow. The individual flowers are about two and a half inches in diameter and have a delicate perfume; the leaves are small and pale green. It is a hardy and fast-growing shrub, and has every appearance of becoming a large plant. Perhaps no other single-flowered Rose is so beautiful, although the Cherokee Rose, another Chinese Rose (*R. laevigata*) naturalized in the southern states, has handsomer foliage and larger flowers, but the flowers of the Cherokee Rose are white and are not produced in such profusion, and in the north the Cherokee Rose can only be grown under glass. *Rosa Hugonis* and *R. omeiensis*, a tall-growing, white-flowered species from Western China, are the earliest Roses to flower in the Arboretum this year.

Rosa Ecae. This is another yellow-flowered Rose which is blooming well this year in the Shrub Collection and is only a little later than *R. Hugonis*. It is a spiny shrub with small leaves and pale yellow flowers not much more than an inch and a quarter in diameter. It is a native of Afghanistan where it is common on dry mountain ridges, and of Samarkand. Much less beautiful than *R. Hugonis*, it is worth a place in a collection of Roses, for species with yellow flowers which are hardy in this climate are few in number.

Syringa Koehneana. This Lilac, which flowered for the first time in the Arboretum two years ago, is bearing a much more abundant crop of flowers than it has produced here before. It is a native of northern Korea, and is a very large, vigorous and hardy shrub with slender branches which bend under the broad open clusters of small rose-colored or pink flowers with long, slender corolla-tubes and not much perfume. The leaves are large, pointed and covered below with a coating of pale hairs. While it is not one of the handsomest Lilacs, it is an interesting addition to the number of species of this genus which can be successfully grown here. There are two large specimens, which have been in the Arboretum since 1902, on the bank next to the Forsythias at the lower end of the Lilac Collection.

Aesculus Briotii. This is a form of the so-called red-flowered hybrid Horsechestnut (*Aesculus carnea*) and is now in bloom in the Aesculus Collection on the right-hand side of the Meadow Road beyond the Linden Group. It is the most brilliantly colored of all the forms of *Aesculus carnea* and few trees hardy in this climate bear such showy flowers. This tree begins to bloom when not more than eight or ten feet high; it is perfectly hardy and should be seen more generally in American gardens.

Aesculus georgiana. This shrub, which is a native of central Georgia, is flowering freely again this spring and is now covered with its compact clusters of yellow and rose-colored flowers. This interesting and handsome shrub is able, apparently, to support perfectly the New England climate, and it is one of the handsomest of American shrubs made known and introduced into cultivation by the Arboretum.

Aesculus discolor. The scarlet-flowered variety (var. *mollis*) of this Buckeye is blooming again this spring in the Arboretum, and there now seems little doubt that this southern shrub, or small tree, can adapt itself to New England conditions. On the typical *Aesculus discolor* the flowers have a red calyx and yellow petals generally more or less flushed with rose. It is a much less common plant than the variety *mollis* on which both the calyx and the corolla are bright red. The variety is a common plant in Georgia and Alabama, and ranges west to southeastern Missouri and to eastern Texas. *Aesculus discolor* and its varieties can be distinguished from other American Buckeyes by the soft covering of pale down on the lower surface of the leaflets, and from all species of the genus except *Aesculus californica* by the pale orange-brown color of the seeds. *Aesculus discolor*, var. *mollis* is an important addition to the list of shrubs with brilliant flowers which can be successfully cultivated in northern gardens.

ARNOLD ARBORETUM

HARVARD UNIVERSITY



BULLETIN

OF

POPULAR INFORMATION

JAMAICA PLAIN, MASS.

JUNE 20, 1917

Rhododendrons. The flowering of the principal Rhododendrons in the collection is very late this year but the plants are in an unusually good condition and many varieties will be in bloom this week. Persons who desire to cultivate these plants must remember that Rhododendrons, including all Azaleas, cannot live in soil impregnated with lime. Rhododendrons are not hardy north of Massachusetts, and south of Pennsylvania the summer sun is too hot for them. The range therefore in eastern North America where these plants can be successfully cultivated is comparatively small, but probably the northwest coast of North America from southern British Columbia to northern California is as well suited for these plants as any part of the world, and there can be grown in addition to all the varieties common in European gardens the Himalayan and Chinese species which here in the east can only be kept alive in glass houses, and in Europe thrive only in a few exceptionally favorable places like Cornwall or in the neighborhood of the Italian lakes.

Rhododendrons, although they are moisture-loving plants, do not thrive in undrained positions; they do best in soil in which loam and peat have been equally mixed, although peat is not always essential to the successful cultivation of these plants. They should be planted where the roots of trees cannot take away moisture from them, and the best position for these plants is on the north side but not too near coniferous trees, as they are planted in the Arboretum. In such positions they are protected from the direct rays of the sun in March and April, for in this climate where the roots are in frozen ground in winter and therefore cannot take up moisture, it is important to reduce as much as possible winter and early spring evaporation from the leaves. It is this evaporation from the leaves of evergreens growing

in frozen soil which makes it impossible to keep alive many of them in this country; and this is the reason why it is desirable here to water thoroughly Rhododendrons just before the ground freezes in the autumn. Rhododendrons imported from Europe suffer here from the stock on which they have been grafted. The almost universal custom among European nurserymen is to use *Rhododendron ponticum* as the stock for these plants because it is easily and quickly raised and readily grafted. *R. ponticum* is not at all hardy here, and there is little doubt that our want of success with Rhododendrons imported from Europe is due, in part at least, to the stock on which they have been grafted and that the gradual or sudden death here of large plants which have been uninjured by cold or drought for twenty or thirty years is due to this cause.

The familiar Rhododendrons of New England gardens are so-called Catawbiense Hybrids and were raised in Europe many years ago by crossing *R. catawbiense*, a native of the highest summits of the Appalachian Mountains, with Himalayan species, notably the scarlet-flowered *R. arboreum*. It might be expected that plants obtained from these crosses would be hardy in proportion to the predominance of the American plant but, judging by the color of the flowers, this is not always true. Varieties like *Atrosanguineum*, *Charles Dickens* and *H. W. Sargent*, which have flowers as bright red as those of *R. arboreum*, are among the hardiest of all garden Rhododendrons; but varieties with white or pale flowers are more tender than those with rose pink or purple flowers which most closely show the influence of the Catawbiense parent; and unfortunately the varieties with light-colored flowers marked at the base with large brown or chocolate-colored blotches, like *Sapho*, are not at all hardy here.

The hardiness of these hybrid Rhododendrons can only be determined by trial, although in selecting varieties for trial it is safe to assume that plants with broad leaves resembling those of *R. catawbiense*, like *Everestianum*, *Mrs. C. S. Sargent*, *Roseum elegans*, *Henrietta Sargent*, *Catawbiense album*, and all the varieties with light or dark purple flowers are likely to prove hardier than the plants with narrow leaves like *Mrs. John Chitto*n. There are, of course, exceptions to such a rule. For example, *Pink Pearl* has broad leaves and is very tender; and *Gomer Waterer*, although it has leaves as broad as those of any of these hybrids, usually suffers in winter and almost invariably loses its flower-buds.

Persons who want to plant Catawbiense Hybrid Rhododendrons should take advantage of the knowledge which has been laboriously and expensively obtained about these plants at Wellesley on Mr. Hunnewell's estate, where Rhododendrons have been tested on a large scale for sixty years, and here at the Arboretum where many of the hardiest kinds raised in England, Germany, and the United States will now soon be in flower.

There are other evergreen Rhododendrons which are not as often cultivated here in Massachusetts as they might be. *R. catawbiense* itself is perfectly hardy and none of its hybrids have handsomer foliage. It grows slowly, however, and never to a very large size, and the flowers are of a disagreeable purple rose color.

Rhododendron maximum, which grows naturally as far north as southern New Hampshire, is a large plant sometimes treelike in habit,

with handsome, long, narrow leaves and small clusters of beautiful pink and white flowers. It is the last of the *Rhododendrons* to bloom here, and the flower-buds do not open until the new branchlets have nearly finished their growth, so that the flower-clusters are a good deal hidden by them.

The varieties and hybrids of the dwarf *Rhododendron caucasicum* bloom before the Catawbiense Hybrids, and the flowers have already faded. The latest of this race to flower, and perhaps the best of them all here, is a low, broad, compact plant with pure white flowers called *Boule de Neige*. This is a perfectly hardy, free-flowering plant which might to advantage be more generally planted in Massachusetts.

Rhododendron carolinianum. Another year increases our admiration for this native of the slopes of the southern Appalachian Mountains which is the handsomest of the small *Rhododendrons* in the Arboretum collection. It is perfectly hardy, the habit is excellent, and the leaves are very dark green above and rusty below. It flourishes in the full sun or in deep shade, and never fails to produce abundant crops of its clusters of pale rose-pink flowers. This is one of the best of the broad-leaved evergreens recently introduced into our gardens.

Rhododendron Smirnowii is a plant with which Americans interested in the cultivation of *Rhododendrons* would do well to become acquainted, for it is not only a beautiful plant but may prove exceedingly valuable in the production of a new race of hybrid *Rhododendrons* better suited for this climate than any which we now have. It is a native of the Caucasus and a large shrub with pale gray-green leaves coated below with a thick mat of pale felt, and large pink or rose-pink flowers in medium-sized clusters. The leaves are not as handsome as those of *R. catawbiense* and its hybrids, and when the plants are fully exposed to the sun the leaves sometimes curl up in very hot weather. The felt on their lower surface, however, protects them from the attacks of the lace-leaf fly from which other *Rhododendrons* suffer so seriously here. By crossing this *Rhododendron* with *R. catawbiense* or with some of the hardiest of its hybrids it may be possible to obtain plants superior to any now in our gardens. A Japanese species,

Rhododendron brachycarpum, may also prove valuable for crossing with *R. Smirnowii* or *R. catawbiense*. This is a species of the high mountains of Japan, with large, dark green leaves and large clusters of very pale yellow flowers; it is an exceedingly rare plant in western gardens and does not appear to have been much cultivated by the Japanese. It was one of the plants brought from Japan in 1862 by Mr. Gordon Dexter of Boston and it grew to a large size and flowered for many years in Francis Parkman's garden in Jamaica Plain. This specimen was later transferred to the Arboretum and is no longer alive. There are now seedling plants here, and there is no reason why this handsome species should not become common in American gardens.

Chinese Cotoneasters. All the deciduous-leaved species of Chinese *Cotoneasters* have come through the winter without injury, and many of them are now covered with flowers. As a flowering plant *C. hupehensis* is perhaps the most beautiful, and of all the shrubs introduced by Wilson from China it is the handsomest or one of the handsomest when in flower. It is a broad, tall shrub with very slender arching branches which are now so covered with flowers that at a distance it

looks more like a *Spiraea* than a *Cotoneaster*. The flowers are white, in small clusters which stand up well above the leaves. The fruit is bright red and lustrous, but it has not yet been produced here very profusely and as it is a good deal hidden by the leaves this species is not as showy in the autumn as several of the others. *C. nitens* and *C. divaricata* are covered with their small bright red flowers which make them attractive at this season of the year. They are large and vigorous shrubs with arching stems and dark green and very lustrous leaves; the former has reddish black fruit and *C. divaricata*, which is the larger plant of the two has bright red fruit. All the plants in this group are good garden plants in this climate, and among them are some of the most valuable additions which have been made in recent years to the New England garden flora. The largest specimens of the Chinese *Cotoneasters* are among the other Chinese shrubs on the southern slope of Bussey Hill; many of them are also in the general Shrub Collection and on Hickory Path near Centre Street.

Xanthoceras sorbifolia. This handsome Chinese shrub or small tree has flowered unusually well in the Shrub Collection this year. It has dark green leaves and erect and spreading racemes of white flowers marked with red at the base of the petals, and fruit like that of a Buckeye. This interesting plant is related to the so-called Texas Buckeye, *Ungnadia*, and to *Koelruteria*, the yellow-flowered Chinese tree which blooms here at midsummer. *Xanthoceras*, of which there is but a single species, is not new in gardens. It is very hardy but has a way of dying without any apparent cause, and for this reason it is not as often cultivated as it might be for when it flowers as it has here this year few shrubs are more beautiful.

Symplocos paniculata, or as it is often called, *S. crataegoides*, is a native of Japan, China and the Himalayas. The form which is cultivated here is Japanese, and is a tall, broad shrub, with large, obovate, dark green deciduous leaves, small white flowers in abundant, compact panicles which open after the leaves are nearly full grown and are followed in the autumn by bright blue fruits about one-third of an inch in diameter. Although the plants are attractive when in bloom, the fruit of a color unusual among that of hardy shrubs is the most interesting thing about it. There are large plants now in flower in the general Shrub Collection and on the side of the Bussey Hill Road just above the Lilacs. Apparently this shrub does not flourish in soil impregnated with lime, at least it has been found impossible to make it live in Rochester, New York.

The cold and rainy season has so delayed the blooming of early flowering plants like Lilacs, which were three weeks later than usual, that trees and shrubs whose flowering periods are normally several weeks apart are now in bloom together, and probably there has never been a time when so many different flowers could be seen here at once as are open this week. Azaleas, Rhododendrons, Wisterias, Viburnums, Cornels, Laburnums, American Crabapples, Hawthorns, Roses, Diervillas, Dipeltas, Syringas, Horsechestnuts, Buckeyes, Maples, Barberries, Siberian Pea-trees, Aronias, Robinias, Mountain Ashes, and *Cotoneasters* are a few of the genera represented by many species which are now covered with flowers in the Arboretum.

ARNOLD ARBORETUM
HARVARD UNIVERSITYBULLETIN
OF
POPULAR INFORMATION

JAMAICA PLAIN, MASS.

JUNE 23, 1917

Deutzias. If all the species and hybrids of *Deutzias* are considered this genus is not a great success in this region where many of the plants are not hardy and others only flourish in exceptionally sheltered and favorable conditions. As is usually the case, the *Deutzias* in the Shrub Collection suffered last winter, and although none of the plants were actually killed, with few exceptions they have been killed back to the ground, or nearly to the ground, and will not flower. In the large supplementary collection in a bed among the Hickories, on a path leading from Hickory Path, the plants are in unusually good condition now, however, and many of them are in bloom or will bloom during the next month. Much attention has been paid to hybridizing species of this genus, and probably the most generally useful *Deutzia* for this region is a hybrid between the Japanese *D. gracilis* and the Chinese *D. parviflora*. *D. gracilis* is a dwarf shrub with pure white flowers in erect or spreading racemes. This is an old and popular garden plant better worth growing in the southern and middle states, however, than it is in Massachusetts where the ends of the branches are often more or less killed. *Deutzia parviflora* is a large, vigorous and hardy shrub with flowers in compact, many-flowered corymbs. It is a native of northern China and Mongolia. The hybrid between these two species was made by the French hybridizer Lemoine many years ago and has been called *D. Lemoinei*. It is a large shrub sometimes five or six feet high and broad which covers itself with large broad clusters of pure white flowers. Handsome and more compact forms of this hybrid are varieties *compacta*, *Boule de Neige*, *Avalanche*, and *Candelabre*. These are now all in bloom, and in this group *Boule de Neige* is perhaps the most beautiful.

Some of the varieties of another of the Lemoine hybrids called *D.*

rosea are flowering well this year and promise to be good garden plants in sheltered situations. This hybrid was obtained by crossing *D. gracilis* and *D. purpurascens*, sometimes called *D. discolor*, var. *purpurascens*. This plant has petals which are purple on the outer surface, and is usually not hardy here. *D. rosea* and its varieties have flowers more or less tinged with purple. Those now in bloom are var. *eximia*, var. *floribunda*, and var. *campanulata*, the latter with nearly white flowers. *Deutzia myriantha* is another hybrid obtained by crossing *D. Lemoinei* and *D. purpurascens*. This has white flowers and is not yet in bloom, but two of its varieties, var. *Boule Rose* and var. *Fleur de Pommier* are now flowering and are handsome and apparently hardy plants with flowers tinged with rose.

Deutzia scabra. This native of Japan and China is one of the hardiest and most generally cultivated of all the *Deutzias*. It is a tall shrub with reddish branches, very rough leaves and erect clusters of white flowers sometimes flushed with rose, which will not open for two or three weeks. This is the *Deutzia* of old gardens north and south. The variety *crenata* has brown branches and less rough leaves, and although less common in gardens appears to be equally hardy. The variety *Watereri* has flowers tinged with red on the outer surface of the petals. Variety *plena* has double flowers with petals tinged with rose color. The variety *Pride of Rochester* has large flowers tinged with rose and is one of the handsomest of this group. The var. *can-didissima* (*D. Wellsii* of some gardens and the *D. alba plena* of others) has pure white double flowers.

Deutzia reflexa and *D. globosa* are natives of western China and did not suffer last winter. They are now covered with flower-buds, but it is too soon to speak with certainty of their value in this climate.

Deutzia longifolia is a tall shrub with erect branches, lance-shaped leaves, and clusters of large flowers. This native of western China is probably one of the handsomest of the Chinese species, but, although it is not killed here by cold, the branches are always badly injured and the flower-buds are also injured.

Deutzia grandiflora is one of the most distinct species of the genus and the first to bloom. The flowers open with the unfolding of the leaves, and are in from one- to three-flowered clusters with white petals three-quarters of an inch long. This plant, which is exceedingly rare in cultivation, is a native of northern China and can be seen with the other Chinese shrubs on Bussey Hill.

Deutzia hypoglauca is a distinct and hardy new species from northern China and is a tall shrub with erect stems and clusters of white flowers, which promises to be a good garden plant in this climate.

Deutzia Vilmorinae from central China is hardy in sheltered positions and is also a tall shrub with gracefully spreading stems, loose clusters of white flowers and lance-shaped, pointed leaves covered with stellate clusters of hairs. By crossing this species with *D. scabra* a hardy and handsome hybrid has been obtained to which the name *D. magnifica* has been given.

Deutzia discolor is another fairly hardy species from central China with hemispherical clusters of white flowers which are three-quarters of an inch in diameter. The variety *major* of this species has rather larger flowers and is a larger and apparently a more vigorous plant. It can be seen with other Chinese species on the southern slope of Bussey Hill.

Deutzia kalmiaeflora. *Deutzia purpurascens* is not hardy but by crossing it with *D. parviflora* a hardy or nearly hardy plant has been obtained to which the name of *D. kalmiaeflora* has been given. This hybrid has carmine-colored flowers about three-quarters of an inch in diameter, in small compact clusters. When it does well this is one of the handsomest of the hybrid Deutzias.

Deutzia Sieboldiana is a dwarf Japanese species with small white flowers and much less valuable as a garden plant than many of the other species. A hybrid (*D. candelabrum*) obtained by crossing it with *D. gracilis* is a handsome plant with gracefully drooping branches which are covered with elongated clusters of white flowers.

Cornus controversa. This handsome Cornel, like the native *Cornus alternifolia*, has alternate leaves and wide-spreading branches, but the flower-clusters are broader; it blooms here a week or ten days earlier, and it is a much larger tree, as Wilson saw specimens in western China fully sixty feet high. It is a native of the Himalayan Mountains, western China and of Japan. The plants raised from the seeds collected by Wilson in China have proved perfectly hardy in the Arboretum where they are growing vigorously and are now in bloom in the supplementary Cornel collection in the rear of the Phelldendron Group on the right-hand side of the Meadow Road. The largest plant in the Arboretum and probably the largest in the United States is also in flower in the nursery near the top of Peter's Hill. This Cornel gives every promise of being a valuable ornamental tree in this climate.

Laburnums. These plants in England, at least, are popularly called Golden Chain from their long drooping clusters of bright yellow flowers. In many European countries, especially in Great Britain, the Laburnums are among the most popular and most beloved garden plants, but are less commonly seen in this country. *Laburnum anagyroides*, better known as *L. vulgare*, has been more often planted here than the other species and varieties. It is a native of southern Europe and is a small tree usually from twenty to thirty feet high. It is not always perfectly hardy in Massachusetts, but occasionally large specimens can be seen in old gardens in the suburbs of Boston, and just now such trees are completely covered with flowers and are beautiful and impressive objects. There are several varieties of this Laburnum in the Arboretum collection and several of them are in bloom. The var. *bullatum*, often called var. *involutum*, has curled and contorted leaves and is the least attractive of all the Laburnums. The var. *quercifolium* has sinuately lobed leaflets; var. *pendulum* has pendulous branches, and the var. *semperflorum* produces a second crop of flowers in the autumn.

Laburnum alpinum, a native of the mountainous regions of southern Europe but in England often called the Scotch Laburnum, is a hardier plant than *L. anagyroides*. It is more often a large shrub than a tree, although it is occasionally treelike in habit. It blooms usually ten days later and the flower-clusters are larger and narrower. A hybrid between these two species of garden origin known as *L. Watereri* and as *L. Parksii* has the treelike habit of *L. anagyroides* and the long slender flower-clusters of *L. alpinum*. This tree is very hardy and the handsomest tree with yellow flowers which is hardy in this climate, as *L. alpinum* is the handsomest large shrub with yellow flowers which can be grown here.

Laburnum Adami is a hybrid between *L. anagyroides* and *Cytisus purpureus* with the habit and foliage of the former, and dull purple or rarely yellow flowers. It is more curious than beautiful. The other species of Laburnum, *L. caramanicum*, is a small shrub from Asia Minor with long, slender, erect, terminal clusters of small flowers and is not hardy here.

Neillia sinensis. This is the only member of a genus of the Rose Family related to Spiraea which has flowered in the Arboretum. It is a native of western China, and is a tall, hardy shrub with slender gracefully spreading and drooping branches, light green, incisedly cut, pointed leaves from an inch and a half to two inches long, and clear pink flowers about half an inch in length, in short terminal racemes. This is one of the handsomest and most interesting of the hardy shrubs introduced by Wilson from western China. The largest plants are on the upper side of Hickory Path, near Centre Street, and there are plants also in bloom in the Chinese Collection of Shrubs on the southern slope of Bussey Hill. Two other pink-flowered species introduced by Wilson, *N. longiracemosa* and *N. affinis*, have not flowered yet in the Arboretum and appear to be less hardy than *N. sinensis*.

Scotch Roses. A plant of the Burnet or Scotch Rose (*Rosa spinosissima*) as it is often called, with its prickly stems, small leaves, white flowers and globular black fruits can be found in most old-fashioned northern gardens for it is a very hardy plant resistant to abuse and handsome when its spreading branches are covered with flowers which unfortunately last but a short time. A variety of this plant from southern Siberia (var. *altaica* or *grandiflora*) is a larger plant with larger flowers faintly tinged with yellow, and one of the handsomest of all single-flowered Roses which can be grown in this climate where it can make a dense bush six or seven feet high and broad. This plant produces great numbers of suckers by which it can be easily increased. The variety *hispida* is a tall growing plant with erect stems and yellow flowers from two and a half to three inches in diameter. Var. *fulgens* has pale pink flowers and the variety *lutea* pale yellow flowers. From the garden of the Duke of Buccleuch at Dalkeith, near Edinburgh, the Arboretum received a few years ago a collection of Scotch Roses for which this garden was once famous. A plant in this collection called Jupiter, with pale pink single flowers, and another called Lady Boilles with small pale yellow flowers are attractive and worth attention. The Scotch Roses are with the other species in the general Shrub Collection.

ARNOLD ARBORETUM

HARVARD UNIVERSITY

BULLETIN
OF
POPULAR INFORMATION

JAMAICA PLAIN, MASS.

JUNE 29, 1917

Late Lilacs. A group of Lilacs which bloom later than any of the forms of the common garden Lilac (*Syringa vulgaris*) and earlier than the so-called Tree Lilacs makes the period of Lilac flowers here continuous for nearly two months. These late-flowering Lilacs have been in bloom for several days. The first of them known in gardens was a Hungarian species, *Syringa Josikaea*. This is a tall narrow shrub with erect stems, broadly elliptic, dark green, lustrous leaves and narrow open clusters six or seven inches long of small violet-colored, long-tubed flowers. Interesting from the point of botanical geography, as its home is further west than that of any other Lilac, it is the least attractive as a flowering plant of all Lilacs with the exception, perhaps, of the Chinese *Syringa pinnatifolia*. Five years later in 1840 the second of these late-flowering Lilacs, *S. Emodii*, was cultivated in English gardens. It is a large broad shrub with large leaves pale on the lower surface and broad clusters of light lilac or nearly white flowers, and is a native of the Himalayas. This shrub is hardy in the Arboretum in a sheltered position, and occasionally flowers here. In this climate, however, it has little to recommend it as an ornamental plant.

The most valuable in this group has proved to be *Syringa villosa*, a native of northern China, and sometimes called *S. Bretschneideri* and *S. Emodi*, var. *villosa*. This plant was first raised in the United States at the Arboretum in 1882 from seeds which had been sent from St. Petersburg by Dr. Bretschneider, and is now often seen in our northern gardens. As it grows in this country it is a round-topped, handsome bush ten or twelve feet high and wide, with large, broadly elliptic to oblong leaves bright green and dull on the upper surface, and compact, broad or rarely narrow clusters of flesh-colored or nearly

white flowers. As a garden plant this is one of the handsomest of the Lilacs for its habit is excellent, and it flowers freely every year, the flowers remaining in good condition for several days. Unfortunately they have a rather disagreeable odor like those of the Privet. Two plants now found in some nurseries under the names of *S. Josikaea pallida* and *S. Josikaea rosea* are only forms of *S. villosa* with slightly different colored flowers. Plants under these names were cultivated, however, in Europe several years before the discovery of *S. villosa*, and if they or other varieties of *S. Josikaea* are known to any of the readers of these Bulletins the Arboretum will be glad to hear from them.

In the hands of the skilful French gardener L. Henry *Syringa villosa* crossed with *S. Josikaea* has produced a remarkable race of hybrids to which the general name of *S. Henryi* has been given. Plants of this breed are large, very vigorous, perfectly hardy and grow rapidly. The foliage resembles in a general way that of *S. villosa*, but the flowers are violet-purple or reddish-purple and are produced in great clusters twelve or fifteen inches long and broad. One of the handsomest of this race has violet-purple flowers and has been named Lutèce. The var. *eximia* has more compact clusters of rose-colored or reddish flowers which after opening become light pink.

Another of the late-flowering Lilacs, *S. Wolfii*, is a native of Mongolia or northern Korea and is still little known either as a wild plant or in gardens. It reached the Arboretum in 1906 from St. Petersburg where it had been sent by the Russian traveler and botanist Komarov. The foliage resembles that of *S. villosa*, but the flowers are produced in much larger clusters and are smaller and violet-purple; in color they resemble that of the flowers of the hybrid Lilac Lutèce but they are smaller and in denser clusters than those of that plant. When *Syringa Wolfii* is better known it will probably be considered one of the handsomest of this group of late-flowering Lilacs.

With the exception of *Syringa Meyeri* and *S. pinnatifolia*, all the new Lilacs from western China flower late, and several of them have been in bloom during the past week. The most interesting of these new Lilacs is *S. reflexa*, a large shrub with ample dark green leaves and long, narrow, compact, drooping clusters of pink flowers which are bright red before opening. This Lilac differs from all others in the drooping flower-clusters and for this reason will probably become a popular garden plant.

Syringa Julianae has been covered with flowers again this year and is a valuable plant in this climate. It is related to *S. pubescens* and has the same shaped flowers with long narrow corolla-tubes, but although fragrant the flowers are less fragrant than those of that species and are produced in shorter clusters. The beauty of the flower-cluster is increased by the contrast between the violet-purple color of the outer surface of the corolla and the white inner surface of its lobes.

Syringa tomentella, with which, judging by the plants growing in the Arboretum *S. Wilsonii* is identical, is a tall, fast-growing and perfectly hardy shrub with slender arching stems and open habit. The foliage resembles that of *S. villosa* and the flowers are produced in large loose clusters and are of the palest rose color with long and slender corolla-tubes.

Syringa Sweginzowii is flowering well here this year as it has for two or three years. The leaves are dark dull green and sharply pointed, and the flowers are borne in long narrow clusters; they are delicately fragrant, half an inch long, with very slender corolla-tubes, and are flesh-colored in the bud, becoming nearly white after the buds open. This species flowers freely even as a small plant and is well worth a place in a collection of Lilacs.

Syringa yunnanensis, although it is a native of southwestern China, is quite hardy in the Arboretum where it is flowering now for the fourth year. It is related, like most of the species of western China, to *S. villosa* and is a tall shrub of open habit with glabrous leaves pale on the lower surface and long narrow clusters of light flesh-colored or pink flowers. Geographically interesting, this plant is probably of less value as a garden plant than *S. Sweginzowii*.

The Tree Lilacs. As the flowers of the late-flowering group of Lilacs fade the earliest flowers of the so-called Tree Lilacs begin to open. There are three of these Lilacs which all bear large clusters of white or yellowish white flowers with a corolla shorter than the stamens, while in other Lilacs the corolla is longer than the stamens which are hidden in its throat. The flowers of the Tree Lilacs all have the disagreeable odor of the flowers of the Privet, and the leaves fall in the autumn without change of color. The first of these plants to flower, *S. amurensis*, a native of eastern Siberia as its name implies, is a shrub in habit twelve or fifteen feet high with dark close bark, broad thick leaves dark green above and pale below, and short, broad, unsymmetrical flower-clusters. *S. pekinensis* from northern China flowers next. This is also shrubby in habit, sometimes twenty or thirty feet tall and broad, with stout, spreading stems covered with yellow-brown bark separating readily into thin plates like that of some of the Birch-trees, dark green, narrow, pointed leaves and short and unsymmetrical flower-clusters usually in pairs at the ends of the branches. This species holds its leaves later in the autumn than the others, and produces great quantities of flowers every year, the other species usually flowering abundantly only every other year.

The last of the Tree Lilacs to flower, *S. japonica*, is a native of northern Japan, and is really a tree sometimes forty feet high with a tall straight trunk covered with lustrous brown bark like the bark of a Cherry-tree, a round-topped head of upright branches, broad, thick, dark green leaves, and erect, mostly symmetrical flower-clusters from twelve to eighteen inches long. This is one of the handsomest of the small trees which bloom here at the end of June or early in July.

Cornus Kousa is a small tree which in eastern Asia enlivens the forests as *Cornus florida* enlivens the forests of eastern North America, and *Cornus Nuttallii* those of our Pacific states. The three species have the large white or creamy white bracts under the flower-clusters which make the inflorescence so conspicuous, but the Asiatic tree differs from the American trees by the union of the fruits into a globular fleshy head, while the fruits of the American trees are not united together. *Cornus Kousa* is a small tree rarely exceeding twenty feet in height, and the floral bracts are narrower, more pointed and not as pure white as those of the American trees. It is valuable, however,

because it flowers three or four weeks later than *C. florida*. *C. Kousa* is a native of central Japan and was found in western China by Wilson. The Japanese and Chinese plants are both now in flower, the former on Hickory Path near Centre Street and the latter with the Chinese shrubs on the southern slope of Bussey Hill. The floral bracts of the Chinese plant in the Arboretum overlap and are broader and less pointed than those of the Japanese form, and the inflorescence, which is three inches across, is much handsomer than that of the Japanese plant. The handsomest form of the Japanese tree which has been seen in this neighborhood is growing in Mount Auburn Cemetery where it has become an object of much beauty and interest.

Indigofera Potaninii has been raised at the Arboretum from seeds collected in the Province of Kansu by William Purdom during his collecting trip in northern China for the Arboretum. It is a beautiful little shrub now in bloom for the second year in the collection of Chinese shrubs on the southern slope of Bussey Hill. As it grows here it is three to four feet high, with a single stem and slender erect branches. The flowers are bright rose color, half an inch long, in long-stalked, erect and spreading racemes from two to three inches in length, from the axils of leaves on branches of the current year, and as the branches lengthen new flower-clusters appear and the plant remains in bloom for a long time. The flowers are of the same color but are larger than those of *Indigofera umblyantha* which Wilson found in western China and which until *I. Potaninii* bloomed was considered the handsomest shrubby species which could be grown here.

Cornus rugosa. Attention is called to the value of this common native shrub for the decoration of parks and gardens where, like many other eastern American trees and shrubs, it is rarely seen. *C. rugosa*, or *C. circinata* as it is still best known, is a shrub sometimes ten feet high which with plenty of space spreads into broad thickets. The young branches are green blotched with purple, becoming purple as they grow older. The leaves are broad, sometimes nearly circular, and dark bluish green; the flowers are ivory white, in compact clusters, and are followed in the early autumn by bright blue or nearly white fruits. This Cornel has been much planted in the Arboretum and is greatly improved by good cultivation. It can be seen in the Cornel Group at the junction of the Meadow and the Bussey Hill Roads; and the large individual plants and the great clumps on the right-hand side of the Bussey Hill Road beyond the Lilacs, and the masses among the Hickories in the group of these trees show the value of this shrub in park planting when great compact masses of foliage are needed.

Rosa multiflora, var. *cathayensis* is in flower on the southern slope of Bussey Hill. This is a climbing Rose with single pink clustered flowers and the Chinese representative of the better known white-flowered *Rosa multiflora*. This variety *cathayensis* is one of the most beautiful plants of its class, and is interesting as the wild plant from which have been derived the Crimson Rambler, such old-fashioned garden plants as *Rosa multiflora carnea* and *R. multiflora platyphylla*, long popular in England under the name of the Seven Sisters Rose.

ARNOLD ARBORETUM
HARVARD UNIVERSITYBULLETIN
OF
POPULAR INFORMATION

JAMAICA PLAIN, MASS.

JULY 6, 1917

Philadelphus. Among the shrubs which give beauty to northern gardens in early summer *Philadelphus*, or as it is popularly called *Syringa* and *Mock Orange*, is perhaps only surpassed in interest and value by the *Rose* and the *Laurel* (*Kalmia*). It is only the abundant and often delightfully fragrant white flowers of the plants of this genus which are beautiful; for the fruit is a dry capsule; the habit of the plants is not different from that of many other shrubs, and their leaves fall in early autumn without having changed their color. The plants are natives of eastern and western North America, Japan, China, the Himalayas and southeastern Europe. In the Arboretum collection there are some thirty species, several distinct varieties of some of the species, and a large number of hybrids for in few genera of plants has the hybridizer been more successful in producing new and valuable forms. Plants in this group are in bloom in the Arboretum during fully six weeks, the earliest being a form of *Philadelphus Schneekii* named variety *Jackii* for Mr. J. G. Jack, who discovered it in Korea, which in ordinary seasons opens its flower-buds during the last week of May and the latest, or almost the latest, the hybrid *P. insignis*, which does not flower before the middle of July. Among the species which seem best worth a place in the garden is the European species *P. coronarius*, the *Mock Orange* of old gardens, which was cultivated in England before the end of the sixteenth century and was probably one of the first shrubs brought to America by the English. It is a large and hardy shrub and is chiefly valuable for the fragrance of its flowers which are faintly tinged with yellow. A number of seminal forms of this plant are cultivated, including one with yellow leaves, one with double flowers and one with narrow, willow-like leaves, but

none of them have any particular value or interest for the decoration of gardens.

Among the American species which should find a place in all collections of hardy shrubs are *P. inodorus*, *P. pubescens* and *P. microphyllus*. The first is a medium-sized plant with arching branches and large, solitary, pure white, cup-shaped, scentless flowers and by many persons considered the most beautiful of the whole genus. *P. pubescens*, sometimes called *P. latifolius* and *P. grandiflorus*, and known in gardens under various other names, is a native of the southern Appalachian region and a shrub sometimes twenty feet high with stout erect stems and branches, broad leaves, and large, slightly fragrant flowers arranged in erect, from five- to ten-flowered racemes. *P. microphyllus* is a Rocky Mountain species with leaves less than an inch long, and small, intensely fragrant flowers. This is a compact and hardy shrub, growing here in the Arboretum about three feet high and broad.

The most distinct and the handsomest of the Asiatic species which flowers here is *Philadelphus purpurascens*, discovered by Wilson in western China. It is a shrub with long arching stems from which rise numerous branchlets from four to six inches long and spreading at wide angles. On these branchlets the flowers are borne from base to apex on drooping stalks; they are an inch and a half long with a bright purple calyx and pure white petals which do not spread as they do on most of the species but form a bell-shaped corolla, and are exceedingly fragrant. This is one of the handsomest of the shrubs brought from western China to the Arboretum. *Philadelphus Magdalenae* from central China is another handsome plant well worth general cultivation. It is a broad tall shrub with arching stems, small, dark green, finely toothed leaves and pure white fragrant flowers an inch and a quarter in diameter and arranged in drooping, leafy, many-flowered panicles from six to ten inches in length. Few *Syringas* this year in the Arboretum have produced a larger number of flowers or have been more conspicuous objects of beauty. *Philadelphus pekinensis* from northern China and Mongolia is a stout bush rather broader than high which every year produces great quantities of small flowers tinged with yellow and is well worth a place in the garden. Another interesting garden plant, *P. Falconerii*, which is certainly Asiatic and probably Japanese, has narrow, lanceolate leaves and fragrant flowers in from one- to six-flowered racemes, and is distinct in the shape of its leaves and its long narrow petals. This plant was sent to the Arboretum many years ago by the Parsons Nursery at Flushing, Long Island, but nothing more is known of its origin or history.

By crossing *P. coronarius* with *P. microphyllus* the French hybridizer Lemoine obtained many years ago a new race to which the name *Philadelphus Lemoinei* was given. The type of this race is a perfectly hardy shrub four or five feet high and broad, with slender stems which are now bent down by the weight of innumerable flowers. These are intermediate in size between those of the two parents and retain the strong perfume of the flowers of the Rocky Mountain plant. A number of forms of this hybrid, varying in the size and habit of the plant and in the size and shape of the flowers, were produced by Lemoine, and they are all good plants of great beauty and interest. Indeed this

group must be considered one of the great contributions made by man to gardens in the last fifty years. Lemoine produced other hybrids like Conquête, Nuée Blanche, Rosea and Perle Blanche of rather uncertain origin. They are all interesting but perhaps less beautiful than some of the forms of *P. Lemoinei*.

A hybrid probably between *Philadelphus grandiflorus* from the Appalachian region and one of the western species appeared in the Arboretum a few years ago and has been named *P. splendens*. It is a large shrub with erect stems and large scentless flowers, and is one of the handsomest Syringas in the Arboretum collection. Another hybrid, supposed to be between *P. pubescens* (*P. latifolius*) of the southeastern United States and the Himalayan *P. tomentosus*, grows to a larger size than other Syringas. Plants from twenty to thirty feet high of this hybrid can sometimes be seen in old Massachusetts gardens. It is impossible to name all the different species, varieties and hybrids of this genus now growing in the collection in one of these Bulletins, and persons interested in flowering shrubs will do well to visit the collection at this time and see the plants themselves. Many of them are in the general Shrub Collection but a larger number is in the special *Philadelphus* collection on the right-hand side of Bussey Hill opposite the Lilacs.

Late Rhododendrons. Two dwarf hybrid Rhododendrons are now in flower and deserve consideration as rock garden plants. The first, *R. arbutifolium*, is a dense shrub spreading into broad masses of branches occasionally four feet high, small, acute, evergreen leaves, and small rose-purple flowers in small compact clusters. It is considered to be a hybrid between *R. ferrugineum* of the European Alps and *R. minus* (*R. punctatum*) of the southern Appalachian region. *R. arbutifolium* is better known in gardens as *R. Wilsonii*, a name which belongs to a hybrid between two Himalayan Rhododendrons. It is sometimes also cultivated under the names of *R. daphnoides*, *R. Hammondii*, and *R. oleaeifolium*. The second of these plants, *R. myrtifolium*, is believed to be a hybrid between the other European alpine species, *R. hirsutum* and *R. minus*. It is a smaller and more upright growing plant than *R. arbutifolium* and has smaller and broader leaves and much handsomer rose-pink flowers also in compact clusters. It is not usually quite so hardy as *R. myrtifolium* but was uninjured last winter, and the plants are now covered with flowers.

Periploca sepium. To most gardeners who live where the climate is less severe than it is in eastern Massachusetts *Periploca graeca*, a tall, vigorous, climbing plant with dark green leaves and curious green and brown flowers, is familiar. Less known is the species from northern China, *P. sepium*, which has more slender stems which do not climb so high, lanceolate, green and very lustrous leaves and flowers similar to those of *P. graeca* but only about three-quarters of an inch in diameter. It is perfectly hardy here and can now be seen covered with flowers on one of the trellises between the Shrub Collection and the parkway. It produces many suckers from the roots and there is therefore no reason why this beautiful plant should remain so little known in gardens.

Cytisus scoparius, var. Andreanus compactus. This is a dwarf form of a variety of the Scotch Broom (var. *Andreanus*) which differs from the ordinary form of the Broom in the dark crimson wing petals of the flowers. In the Arboretum this dwarf plant with nearly prostrate stems rising only a few inches above the surface of the ground is perfectly hardy, which cannot be said of any of the other varieties of *Cytisus scoparius* which have been tried here, and is now covered with its large and brilliant flowers which make a bright spot in the Shrub Collection and on Hemlock Path near Centre Street.

Late-flowering Viburnums. The Arboretum in early summer owes much to some of the late-flowering Viburnums which have been largely planted here. Among these are three of the blue-fruited American species and the red-fruited Japanese *V. dilatatum*. Of the American species *V. cassinoides* has been in flower during the last two weeks and on many of the plants the flowers have already faded. A native of swamps in the northeastern part of the country, where it sometimes makes slender straggling stems fifteen or twenty feet high, this Viburnum grows well on drier ground and in cultivation is a round-topped and compact shrub. The leaves are thick, lustrous and finely toothed, and vary greatly in size and shape, and the flowers, which are slightly tinged with yellow, are arranged in concave clusters which vary in size on different plants. The fruit is larger than that of the other American summer-flowering Viburnums, and is even handsomer than the flowers. When fully grown it is first yellow-green, later becoming pink and finally blue-black, fruits of the three colors occurring in early autumn in the same cluster. This is one of the handsomest of all the Viburnums which can be successfully cultivated in this climate. The other American late-flowering species are closely related and have more coarsely-toothed leaves, wide flat clusters of white flowers and small blue fruits. The earliest to bloom, *V. dentatum*, is already dropping its flowers. It is a common roadside and meadow shrub in the eastern parts of the country and, like many of our native shrubs, is greatly improved by good cultivation. As its flowers fade those of *V. venosum* begin to open. In habit and general appearance this resembles *V. dentatum*, but the young branches and the lower surface of the leaves are thickly covered with a coat of pale hairs. This Viburnum grows only in the neighborhood of the coast from the southern shores of Cape Cod to New Jersey. *Viburnum Canbyi*, the last of all the Viburnums to flower in the Arboretum, resembles *V. venosum* but flowers two or three weeks later, and the flower-clusters and fruits are larger. It is a native of eastern Pennsylvania, northern Delaware and central Indiana. This Viburnum has grown to a large size in the Arboretum and specimens ten or twelve feet high and broad can be seen near the Administration Building and along the Meadow Road. *V. dilatatum* has been covered with flowers this year and is a broad, shapely and vigorous shrub with very dark green leaves and wide flat clusters of pure white flowers followed late in the autumn by small bright red fruits which often remain on the plants until late in the winter.

ARNOLD ARBORETUM
HARVARD UNIVERSITYBULLETIN
OF
POPULAR INFORMATION

JAMAICA PLAIN, MASS.

JULY 13, 1917

The high price obtained in England before the war for willow wood for cricket bats resulted in investigations of the different trees from which wood suitable for this purpose could be obtained. The most valuable tree for this purpose is described by English timber dealers as "Close Bark" Willow, and is either a form of *Salix alba calva*, or var. *coerulea*, or as some authors believe a species, *S. coerulea*. This "Close Bark" tree from which the best timber for the purpose is obtained is found in England only in a few of the southeastern counties and is a seed-bearing, or pistillate tree, of strict pyramidal habit, sometimes when planted in good soil one hundred feet high, and as it grows rapidly the distance between the lateral branchlets makes the crown of foliage appear thin. That this tree when planted in soil which suits it grows rapidly is shown in the statement published by Elwes in "The Trees of Great Britain and Ireland," that a tree which was planted at Boreham in Essex in 1835 and felled in 1888 when it was one hundred and one feet tall had a trunk five feet nine inches in diameter. From the wood of this tree eleven hundred and seventy-nine cricket bats were made. Elwes reports the purchase of a piece of land for \$250 on which in sixteen years Willows of this variety were grown which sold for \$10,000, and quotes the statement that a good set (a straight piece of a branch about the thickness of a broom-handle to set in the ground like a cutting) costing from twenty-five to thirty cents, when planted in suitable soil and has grown well is worth from \$25 to \$40 in fifteen years.

There are two other Willows which produce wood used for this purpose, although it is considered less valuable. The better of these is one of the hybrids between *Salix alba* and *S. fragilis* for which the

oldest general name is *S. rubens* but which is also called *S. viridis*, *S. Russelliana* and *S. decipiens*. *S. fragilis*, known in the English trade as the "Open Bark" Willow, also furnishes wood used for bats but is considered even less valuable than that of *S. rubens*.

All the so-called Cricket Bat Willows are established in the Arboretum, and it is possible, although hardly probable, that the demand for the wood in England or its Colonies may make the cultivation of the best "Close Bark" Willow a profitable agricultural operation in some parts of this country. It is possible, too, that some other use for the wood of this tree may make its cultivation as a timber tree profitable here. As an ornamental tree, however, this Willow deserves the attention of American planters, for no Willow will grow more rapidly, and in habit it differs from the Tree Willows which are usually seen in the eastern states.

In the northeastern part of North America there are only two native Willows, *Salix nigra* and *S. amygdaloides*, which are trees of any size, and the latter does not grow spontaneously in New England; and the great Tree Willows which make such a feature in the landscape of the northern and middle states are all naturalized European trees. Little critical study, apparently, has been given to these introduced trees and they have usually been considered either the White Willow (*S. alba*) and its variety *coerulea* or the Crack Willow (*S. fragilis*). The Crack Willow is distinguished by its coarsely serrate leaves obliquely long-pointed at the apex, and usually about four inches long and three-quarters of an inch wide. The catkins of staminate flowers of this tree are often forked. It is called Crack Willow because the branchlets are easily separated from the branches in spring. This tree is not rare in New England, and sixty or seventy years ago there were many large specimens in the neighborhood of Boston; but it is more common in eastern Pennsylvania and northern Delaware where it was early introduced by the Duponts to supply charcoal for their powder works.

The White Willow (*S. alba*) can be distinguished from the Crack Willow by its shorter and narrower leaves usually from two to two and a half inches in length and rarely more than half an inch in width, and covered with whitish silky hairs which are most abundant on the lower surface. This, like the Crack Willow, is a large tree with wide-spreading branches. There is a handsome variety of the White Willow on which the young branches and the leaves are thickly covered with silvery white tomentum. This tree is sometimes found in American nurseries where it is usually called *S. regalis*, although the correct name for it is *S. alba*, var. *argentea*. If the real *S. alba* is among the European Willows naturalized in the United States it is probably rare.

The Blue Willow, which is considered by some English botanists to be a variety of the White Willow and by others a species, is a taller and more pyramidal tree with leaves similar in size and shape to those of the White Willow but rather thinner, less covered with down and bluish gray not whitish on the lower surface. It is very doubtful if this tree, which is the best Close Bark Bat Willow, has been naturalized in any part of the United States; and it is probable that the Willow-trees which are scattered along the river-banks of the northern states are hybrids between *S. alba* and *S. fragilis* for which the oldest gen-

eral name is *S. rubens*, although under this general name are several different trees of the same hybrid parentage to which different names have been given.

It is not known here if trees of the two sexes of this hybrid exist in the United States, and nothing is known of the distribution in different parts of the country of the different forms of the hybrid; and if any reader of this Bulletin has paid attention to the Tree Willows naturalized in the United States, the Arboretum will be glad to hear from him.

Staphyleas. A reader of these Bulletins has asked us to say something about Staphyleas, or Bladder Nuts as these plants are popularly called. Staphylea is a genus of shrubs with opposite, trifoliate or pinnate, deciduous leaves and terminal clusters of small white or pinkish flowers, and much inflated, membranaceous, pod-like fruits which vary in length on the different species from one to four inches. There are several species and one hybrid, and a species occurs in each of the chief botanical regions of the northern hemisphere. All these plants, with the exception of the Himalayan *S. Emodi*, are in the Arboretum, but in the Shrub Collection where the winter conditions are more severe than in any other parts of the Arboretum they are often killed nearly to the ground by cold and give little satisfaction. The plants on Azalea and Hickory Paths do better, and probably all the species would flower and ripen their fruit here if the right place could be found for them.

The species of eastern North America, *S. trifolia*, grows from the Province of Quebec westward to Nebraska and southward to Oklahoma and Georgia. It is occasionally seen in old gardens in this country and in England it has been cultivated for two hundred years. As a garden plant, however, it has little to recommend it. The northern California species, *S. Bolanderi*, exists on Hickory Path but has not yet flowered in the Arboretum. *Staphylea holocarpa* has pinkish flowers which appear before the leaves, and is a small tree sometimes twenty feet high discovered by Wilson in central China and considered by him one of the handsomest flowering trees which he saw in China. This plant can be seen on the upper side of Azalea Path where the ends of the branches are often killed by cold; it has not yet flowered in the Arboretum. The species already named have leaves with three leaflets: the following usually have leaves with from five to seven leaflets. *S. pinnata*, which is widely distributed through Europe to western Asia, is a tree-like shrub and sometimes flowers here but has little value as a garden plant in this climate. The Caucasian *S. colchica*, which differs from *S. pinnata* in its larger flowers and fruits and in the lustrous lower surface of the leaves, is the handsomest of the Bladder Nuts and well worth cultivation. Small plants flower freely and are often used in England for the winter decoration of conservatories. A variety of this plant, or a hybrid between it and *S. pinnata*, is *S. Coulombieri* which appeared many years ago in a French nursery and is distinguished by its larger leaves and by the flowers and fruit which are intermediate in size between those of its supposed parents. The variety *Hessei* of *S. colchica*, distinguished by its pinkish flowers, is in the collection but has not yet flowered here.

Some Asiatic Maples. Another reader of these Bulletins asks for information about *Acer capillipes*, *A. truncatum*, *A. mandschuricum* and *A. Henryi*.

Acer capillipes is related to the North American Striped Maple or Moosewood (*Acer pennsylvanicum*) and has the same three-lobed leaves which are bright red as they unfold, smaller fruit on longer stems and even more beautiful green and white striped bark. This Maple appears to be exceedingly rare in Japan. Professor Sargent saw one tree hanging over the bank of the Kisogawa near Agamatsu on the Nagasendo Road in Japan. The plants raised from the seeds gathered by him from this tree appear to be the only ones in cultivation in the United States and Europe. The rarity of this tree is shown by the fact that it was not seen by Wilson in his extensive travels in Japan, and the plants raised from the seed which he secured in Japan of what was called *Acer capillipes* prove to be the common *A. rufinerve*. *A. capillipes* has not grown well in the Arboretum, and the plants now twenty-five years old are still shrubs and have not flowered. Even if it could be obtained, this tree, judging by its behavior in the Arboretum, could not be recommended for planting in the northern states.

Acer truncatum is a native of northern China and was raised at the Arboretum in 1882. It is a small tree with deeply five-lobed leaves usually nearly square at the base, purplish as they unfold and light green and shining during the summer. This tree is perfectly hardy here, although it sometimes suffers from the splitting of the bark in winter. It has not produced seeds in the Arboretum where there are now only comparatively small plants, the plants first raised here having already disappeared. One of the original plants, then about twenty feet high, was standing a few years ago in the Ellwanger & Barry Nursery in Rochester, New York.

Acer mandschuricum is one of the Trifoliate Maples with leaves composed of three narrow, long-pointed leaflets which are red as they unfold and long, slender, bright red stalks. This is one of the large trees in the mountain forests of eastern Siberia, forming a massive trunk and a great head of wide-spreading branches. It is perfectly hardy in the Arboretum where it has grown rapidly and is producing fruit this year for the first time. This is one of the most interesting of the Maples here of recent introduction, and promises to become a valuable ornamental tree in this climate.

Acer Henryi is a small tree of central and northern China, related to the North American Box Elder or Ash-leaved Maple (*Acer Negundo*), from which it differs in the smaller number of leaflets which are usually three, while the leaves of the American *Negundo* are composed of from three to seven leaflets. The flowers of the Chinese tree are provided with petals which are not found on those of its American relative. *A. Henryi*, which has been tried in various situations in the Arboretum, grows badly in all and is usually seriously injured by cold. It cannot therefore be recommended for general cultivation here or as a substitute for the American *Acer Negundo* which is a perfectly hardy and fast-growing tree.

ARNOLD ARBORETUM
HARVARD UNIVERSITY



BULLETIN
OF
POPULAR INFORMATION

JAMAICA PLAIN, MASS.

JULY 21, 1917

Summer-flowering Trees. Several trees flower in summer here and add to the interest of the Arboretum at a season of the year when there are comparatively few flowers or ripe fruits to be seen. The most important of these trees are the Lindens, a genus of many species, the earliest of which begins to bloom about the middle of June and the last five or six weeks later. In the Bulletins published on June 10, 1910, and on July 6th of last year a detailed account of these trees appeared to which persons interested in them are referred; and it is only necessary, perhaps, to say now that Lindens grow best in damp, moist, well-drained soil, and that the European species take more kindly to cultivation in this part of the country than the American or Asiatic species, the handsomest Linden trees planted in the neighborhood of Boston being forms of the natural European hybrid to which the name *Tilia vulgaris* belongs. There is a large collection of Lindens in the Arboretum arranged in the meadow on the right-hand side of the Meadow Road in which can now be seen specimens of most of the species and of several forms and varieties, many of the trees being now large enough to flower. The fact that, with the exception of *Tilia japonica* which is the first Linden here to unfold its leaves, none of the Asiatic Lindens now promise to be large or useful trees in this climate is surprising for the trees of eastern Asia usually flourish here, and as a rule are better able to adapt themselves to New England conditions than allied European trees. It is always possible, however, that by crossing some of the Asiatic species with the European species new and valuable forms may be obtained, for hybrids between American and European Lindens, like *Tilia spectabi-*

lis and its variety *Moltkei*, are trees of great beauty and remarkable rapidity of growth.

Catalpas. Of trees which flower here in summer the Catalpas have the showiest flowers. All the species and one or two hybrids with the exception of the West Indian *C. longissima* are in the collection, although they are not large enough yet to flower here. The first Catalpa to attract attention, *C. bignonioides*, was cultivated early in the eighteenth century in England where it had been sent from South Carolina. About forty years ago it became known that a second species of Catalpa was growing naturally in the lower Ohio valley and southward along the Mississippi River as far as western Tennessee and northeastern Arkansas. It was found that this second Catalpa had larger flowers in fewer-flowered clusters than the more southern tree, that the inner surface of the corolla of the flowers had fewer and smaller spots than that of the other tree; that the pods containing the seeds were stouter and had thicker walls, and that the leaves were much longer-pointed at the apex. The name of *C. speciosa* was given to this tree, and as Catalpa wood is extremely durable when placed in the ground it has been largely planted, especially in some of the prairie states, to produce fence-posts for which it is admirably suited, and for railway ties for which it is too soft. *Catalpa speciosa* is a fast-growing and rather pyramidal tree which on the rich river bottom lands of the Mississippi sometimes rises to the height of one hundred and twenty feet and forms a tall trunk occasionally four and a half feet in diameter. In New England it is a fast-growing, more shapely and much hardier tree than *C. bignonioides* which blooms two or three weeks later. In the northern states, and probably in all parts of the country, the early-flowering *C. speciosa* is the Catalpa which is now commonly planted. There is a dwarf form, var. *nana*, of *C. bignonioides* which is usually known as *C. Bungei* in American nurseries where it is grafted as a standard on the stems of one of the tree Catalpas, and is popular at present for the supposed decoration of gardens which are more or less formal in character and pass in this country for "Italian gardens." It is not known at the Arboretum where this dwarf variety originated or that it has ever flowered. The name *Catalpa Bungei* properly belongs to the tree of northern China with narrow, dark green, long-pointed leaves, small yellowish white flowers and slender pods. This is not so handsome a tree as the American Catalpas but it is geographically interesting, and is perfectly hardy in the Arboretum where it is growing well. It has not yet flowered. Another Chinese species, *C. ovata*, sometimes called *C. Kaempferi*, is much cultivated in Japan whence it was sent to this country many years ago. It is a perfectly hardy little tree with comparatively small dark green leaves, many-flowered clusters of small yellowish spotted flowers and long slender pods. This Catalpa, which will thrive in regions too cold for the American species, has been somewhat planted in the United States, although as an ornamental tree it does not deserve much attention from the lovers of handsome trees. A hybrid (*C. hybrida*) between *C. bignonioides* and *C. ovata* appeared several years ago in the nursery of J. C. Teas at Baysville, Indiana. This is a fast-growing and hardy tree with flowers like those of its American par-

ent, although rather smaller, and arranged in much longer clusters, while the leaves, although larger, resemble in shape those of *C. ovata*. This handsome tree has also been called *Catalpa Teasii*, *C. Teasiana* and Teas' Hybrid Catalpa. Another hybrid of the same parentage has purple leaves and, although it probably originated in a European nursery, has been called var. *japonica*. The two *Catalpas* introduced by Wilson from central and western China, *C. Fargesii* and *C. Duclouxii*, live in the Arboretum but do not yet give much promise that they will become valuable additions to the list of summer-flowering trees which can be successfully grown in this climate.

The Aralia Family furnishes the Arboretum with three handsome trees which flower in late summer or early autumn. They are *Acanthopanax ricinifolium*, *Aralia spinosa* and *A. chinensis* and its varieties. The *Acanthopanax* is a tree which is common in the forests of northern Japan where it is often seventy or eighty feet high with a massive trunk and great wide-spreading branches armed, like the stems of young trees, with many stout prickles. The leaves hang down on long stalks and are nearly circular, five- or seven-lobed and often fifteen or sixteen inches in diameter. The small white flowers are produced in compact, long-stalked clusters which form a flat, compound, terminal panicle from twelve to eighteen inches across and are followed late in the autumn by shining black fruits which do not fall until after the beginning of winter. This tree is perfectly hardy in the Arboretum where it has been growing for twenty-four years and where it has flowered and ripened its seeds now for several seasons. It is one of the most interesting trees in the collection and, because it is so unlike other trees of the northern hemisphere, it is often said to resemble a tree of the tropics. *Aralia spinosa*, the so-called Hercules' Club of the southern states where it is a common inhabitant of the borders of woods and the banks of streams, is a tree often thirty feet high with a tall trunk and wide-spreading branches covered with stout orange-colored prickles. The leaves, which are borne at the ends of the branches, are long-stalked, twice pinnate, and from three to four feet long and two and one-half feet wide. The small white flowers are arranged in compound clusters which rise singly or two or three together above the leaves and are three or four feet long. The fruit is black, rather less than a quarter of an inch in diameter, and ripens in early autumn. For several years this tree did not prove hardy in the Arboretum, but it is now well established on the slope at the northern base of Hemlock Hill in the rear of the Laurel plantation and is now spreading rapidly there over a considerable area by shoots from underground stems. The Asiatic tree *Aralia* resembles in habit and general appearance the American Hercules' Club, but is distinct from that tree in the absence of stalks to the leaflets. There are a number of geographical forms of this tree; the one which is most commonly cultivated in this country is a native of Manchuria and eastern Siberia (var. *mandshurica*) which is sometimes found in nurseries under the name of *Dimorphanthus mandshuricus*. The Japanese form, var. *glabrescens*, is chiefly distinguished from it by the pale color of the under surface of the leaflets; it is less hardy than the Manchurian form and is not often seen in this country.

Sophora japonica is in spite of its name a Chinese tree which has been cultivated in Japan for more than a thousand years, and as it first reached Europe from that country was long considered a native of Japan. It is a round-headed tree which in Peking, where it has been much planted, has grown to a large size and looks from a distance like an Oak-tree. The leaves and branchlets are dark green, and the small, creamy white, pea-shaped flowers, which open here in August, are produced in great numbers in narrow, erect, terminal clusters. There are also in the collection the form with long pendent branches (var. *pendula*) which rarely flowers, and a young plant of the form with erect branches (var. *pyramidalis*). The form of this tree with flowers tinged with rose color (var. *rosea*) is not in the Arboretum. The Sophoras are on the right-hand side of the Bussey Hill Road, opposite the upper end of the Lilac Group. Near them the Maackias are growing. They also belong to the Pea Family, and the better known *Maackia amurensis* is a native of eastern Siberia; it is a small tree with handsome smooth, reddish brown, shining bark, dull, deep green, pinnate leaves and short, narrow, erect spikes of small white flowers which open here soon after the middle of July. There is a form of this tree (var. *Buergeri* in northern Japan which differs from the Siberian tree in the presence of soft down on the lower surface of the leaflets. The species discovered by Wilson in central China, *M. hupehensis*, is growing well in the Arboretum but has not yet flowered.

Oxydendrum arboreum, the Sorrel-tree or Sour Wood, is a native of the southern Appalachian mountain forests and the only tree of the Heath Family which can be grown in this climate, with the exception of the Laurel (*Kalmia latifolia*) and the Rose Bay (*Rhododendron maximum*) which are shrubs at the north and only exceptionally trees in a few favored valleys of the southern mountains. The Sorrel-tree in its native forests grows fifty or sixty feet high, but at the north as it begins to flower abundantly when only a few feet tall, it is not probable that in this climate it will ever attain a considerable size. It is well worth growing, however, for its bright green shining leaves which have a pleasant acidulous flavor and in autumn turn bright scarlet, for its white Andromeda-like flowers erect on the branches of spreading or slightly drooping terminal clusters, and for its pale fruits which in the autumn are conspicuous among the brilliant leaves. There is a group of these plants among the Laurels at the northern base of Hemlock Hill which will flower at the end of July or early in August.

Koelreuteria paniculata. This Chinese tree will also flower before the end of July when it will be conspicuous from its large erect clusters of bright yellow flowers which stand well above the large, dark green, compound leaves and which are followed by large, bladder-like fruits. This is a small hardy tree which is now often planted in this country, especially in the middle states.

These Bulletins will now be discontinued until the autumn.

ARNOLD ARBORETUM

HARVARD UNIVERSITY



BULLETIN

OF

POPULAR INFORMATION

JAMAICA PLAIN, MASS.

OCTOBER 23, 1917

The brilliant autumn coloring of the leaves and the abundant and handsome fruits of many trees and shrubs are conspicuous features in the floras of eastern North America and eastern Asia, and as there are larger collections of these plants in the Arboretum than in other gardens this is the best place to study trees and shrubs with reference to the autumn decoration of parks and gardens in our north-eastern states. Bright autumn colors can be seen in the Arboretum from the middle of September until the middle of November, or even later in exceptional years. Handsome fruits begin to ripen here in July and on some plants they retain their brilliancy until late spring. In Japan the great autumn color effects are in November or a month later than in our northern states, for in Japan the Maples, which are perhaps the most brightly colored of the Japanese trees, take on their autumn colors very late, as they do when transplanted to this country. The leaves of several eastern Asiatic trees change color and fall early. Some of these are *Phellodendron amurense*, *Acer ginnala*, *Acer mandshuricum*, and *Evonymus alatus*.

Phellodendron amurense. This is a small tree from the Amoor region of eastern Siberia. It is chiefly interesting as the type of a small genus with a few species of trees of eastern Asia of the Rue Family, and for its peculiar thick, ridged, pale cork-like bark. Early in October the leaves turn to a bright clear yellow which is hardly equalled in beauty by the yellow of the autumn leaves of any other tree. Unfortunately this beauty is short-lived and the branches are already bare.

Acer ginnala is another small tree or large shrub of the Amoor region. It bears compact clusters of small, nearly white, fragrant flowers and pointed lobed leaves which in October are even more brilliantly scarlet than those of the best of our native Red Maples. This beauty is also short-lived and is already passing. *Acer ginnala* is one of the early introductions of the Arboretum into the United States, and it is fortunate that its decorative value has been recognized by American landscape gardeners and nurserymen, and that it is no longer rare in American plantations.

Acer mandshuricum. This tree is still little known in the United States and Europe. It is one of the trees with leaves composed of three leaflets, and it is one of the largest and handsomest trees of the mountain valleys of Manchuria and Korea. It has slender bright red branchlets, and the narrow leaflets are three or four inches long, gradually pointed at the ends, and are borne on long, slender scarlet stalks. The pale color of their lower surface is retained after the upper surface has turned bright red early in October, and the contrast of the colors of the two surfaces greatly increase the October beauty of this tree. This Maple flowered in the Arboretum for the first time this year and produced a good crop of fruit, which, however, unfortunately proved to be abortive. If this tree is ever taken up by nurserymen there is every reason to believe that it will become one of the most ornamental trees of recent introduction.

Evonymus alatus. To those persons who complain that the Arboretum is not interesting because most of its plants are not known to them or are beyond their immediate reach this Japanese Burning Bush should bring hope and encouragement as well as much joy, for its autumn beauty has long been known and it is now to be found in most American nurseries. The flowers and fruits are small and inconspicuous, and the only real value of this shrub is found in the deep rose color passing to scarlet of its October leaves which are already beginning to fall. That its whole beauty may be seen this shrub should be planted as a single specimen with plenty of space for the free development of its spreading branches, which when it has been well planted will cover a diameter of ten or twelve feet on the ground and form a compact, round-topped bush six or eight feet high. The corky wings on the branchlets to which this plant owes its specific name and which vary in different individuals are interesting. There is a large plant in the *Evonymus* Collection on the right-hand side of the Meadow Road and there is another on the left-hand side of the Bussey Hill Road above the Lilac Collection.

Eastern American Mountain Ashes. As fruit trees the two Mountain Ashes of eastern North America, *Sorbus americana*, and its variety *decora* have been perhaps the handsomest objects in the Arboretum this autumn. The fruit is already almost entirely eaten by birds, for which every year it furnishes here abundant harvests; but attention is now called to these small trees in the hope that they may become as well known in the gardens of southern New England as they are in those of eastern Canada, northern Michigan, Wisconsin and Minnesota.

At its best *Sorbus americana* is a tree twenty or thirty feet tall, but more often and here in the Arboretum it is a large shrub with spreading stems. The leaves are composed of numerous slender pointed leaflets; the small flowers are creamy white and produced in small crowded clusters which do not appear until the leaves are fully grown; in the autumn these turn dull orange-red some time before falling, but the great beauty of the tree is found in its great clusters of small bright orange-red fruits which by their weight become semi-pendent. The variety *decora* is a larger tree with broader leaflets; the flowers are nearly twice as large, and the fruit which is larger and therefore more showy, is of the same color. This variety grows only along the northern border of the eastern and middle states and northward, and is perhaps the handsomest of all Mountain Ashes. Rarely seen in Massachusetts gardens it is often the chief ornament in those of the more northern parts of the country. There is a group of these Mountain Ashes on the right-hand side of the path leading from the Forest Hills entrance into the Shrub Collection.

Prunus hortulana. This is the handsomest of the American Plums and one of the handsomest of the small trees of eastern North America where it grows on rich bottom-lands from southern Illinois to southern Missouri. This is a tree sometimes twenty or thirty feet high, with a trunk covered with dark scaly bark, and stout, wide-spreading branches which form on the trees growing in the Arboretum a dense, round-topped and shapely head. The flowers, which are produced in few-flowered clusters, are sometimes an inch in diameter and open when the leaves are less than half grown. When the trees are in bloom their appearance is not unlike that of several other Plum trees; and the great beauty of this tree is in its habit, in the long pointed, comparatively narrow and very shiny leaves which are now turning a deep bronze-red color. The fruit, too, which looks like a bright red cherry, is an inch in diameter and droops gracefully on slender stalks. It is beautiful although the flesh is hard and austere, and it is not as a fruit tree but as an ornamental tree that this Plum deserves a place in parks and gardens in which small trees are valued. Two specimens can be seen in the Plum Collection on the right-hand side of the grass walk leading into the Shrub Collection from the Meadow Road.

Magnolias. The leaves of the Asiatic Magnolias fall late in the autumn without much change of color, and those of some of the American species, notably *M. acuminata*, the so-called Cucumber-tree, *M. tripetala*, the Umbrella-tree, *M. Fraseri*, the Mountain Magnolia, and the great-leaved *M. macrophylla*, all turn to shades of yellow and brown, which make these trees so conspicuous at this season of the year. The leaves of the yellow-flowered *M. cordata* are still as green as they were at midsummer. Later they also will turn yellow or brown, but the leaves of the Swamp Bay, *M. glauca*, which are still as beautiful as they have been for the last six months, will fall gradually here late in November or early in December without any change of color. Further south they remain on the branches usually until spring.

The group of American Magnolias is between the Jamaica Plain entrance and the Arboretum building.

Two American Viburnums. *V. Lentago* and *V. prunifolium* are even more beautiful now with their large brightly colored leaves and drooping clusters of large, dark blue fruit than they were late in the spring when they were covered with broad clusters of small, creamy white flowers. These are common eastern American plants and are shrubs or small trees, and there are no better subjects for the decoration of woods or forest glades. *V. Lentago* is the more round-topped plant of the two, with larger leaves and larger clusters of flowers, while *V. prunifolium* which naturally does not grow north of southwestern Connecticut, has more spreading branches, smaller clusters of whiter flowers and narrower leaves of a deeper red at this season of the year. These two Viburnums have been largely used in the Arboretum border-plantations which owe much beauty to them. The decorative value of these plants is now recognized and it is possible to find them in several American nurseries.

Ligustrum vulgare. Attention has often been called in these Bulletin to the value of the common European Privet, *Ligustrum vulgare*. In recent years much attention has been paid by botanists and gardeners to the Privets of eastern Asia, where many species have been discovered. None of these, however, are as valuable in this climate as the European species which is perhaps the handsomest of all hardy, black-fruited shrubs. The bright shining fruit is borne in compact clusters which stand up well on the ends of the branches above the dark green lustrous leaves and remain on the plants during the early winter months and after the dark green leaves have fallen. Formerly this was a common garden plant in the northern states and it is now sparingly naturalized in some parts of the country. There is a form with yellow fruit which is much less beautiful than the type. There is a variety *foliolosa* in the collection which has rather narrower leaves and larger fruit. This shrub, although apparently still little known in our gardens, is one of the handsomest of all shrubs here at this season of the year. The specimen in the Shrub Collection is now covered with its large and brilliant fruits, and is well worth a visit by any one interested in the autumn decoration of gardens.

Abelia grandiflora on Hickory Path near Centre Street is still well covered with flowers. These resemble in shape the flowers of some of the Honeysuckles; they are white faintly tinged with rose color, and their delicate beauty is set off by the small dark green and lustrous leaves. *Abelia grandiflora* is a slender shrub with arching stems from three to four feet high, and is thought to be a hybrid between two Chinese species. Until the introduction by the Arboretum of some of the species of this genus from western China it was believed to be the hardiest of the Abelias. In the Arboretum it suffers in severe winters; but in sheltered positions it flowers well every year and the flowers continue to open during nearly two months. This *Abelia* has become an exceedingly popular plant in the gardens of the southern states and is cultivated with more or less success as far north as New York.

ARNOLD ARBORETUM
HARVARD UNIVERSITYBULLETIN
OF
POPULAR INFORMATION

JAMAICA PLAIN, MASS.

OCTOBER 30, 1917

Some American Hawthorns. Among American Hawthorns are many species which are of exceptional value for the beauty of their abundant flowers, their bright-colored fruits and the brilliancy of their autumn foliage. A number of these plants can now be seen to advantage on the bank between the Shrub Collection and the Boston Parkway, and are best reached by the path leading to the right from just inside the Forest Hills gate. These plants were raised at the Arboretum from seed mostly planted between 1880 and 1885, and are therefore less than forty years old. None of these trees, however, have reached anything like their maximum size but are large enough to show their habit of growth and their character as garden ornaments. Hawthorns are usually long-lived plants, and individuals a hundred years old are not uncommon; and, although it takes several years to produce a good Hawthorn collection, once established the plants will go on improving and last for a long time. Hawthorns are easily raised from seeds which require two years in which to germinate. Large specimens are easily transplanted, and all the species thrive in any well-drained soil. Growing naturally, the species are most abundant in those parts of the country where the soil is impregnated with lime, and they are therefore particularly suited to give beauty to the parks and gardens of a large part of the United States where the presence of lime and the character of the climate prevent the cultivation of several classes of plants on which the gardeners of the coast region of the continent depend. Some of the species growing on the bank near the Shrub Collection which are now worth the attention of visitors are:—

Crataegus nitida. This is a native of the bottom-lands of the Mississippi River near East St. Louis where it sometimes grows thirty feet high and forms a tall straight trunk. The wide-spreading lower branches and the erect upper branches form a broad, rather open unsymmetrical head. The leaves are long and comparatively narrow, and those near the ends of the branches are often deeply lobed; they are dark green and very lustrous, and turn yellow, orange or red late in October. The flowers are not more than three-quarters of an inch in diameter, and the scarlet oblong fruit rarely exceeds the length of half an inch. The flowers and fruit, however, are produced in great profusion; and, although many species have larger flowers and handsomer fruits, the habit of this tree, its beautiful foliage and its autumn color make *C. nitida* one of the handsomest Thorn trees. Many persons indeed place it with the six or eight most beautiful species of the genus.

Crataegus pruinosa. There is a good plant of this widely distributed eastern species on the bank. It is a small, round-topped tree with wide, dark blue-green, lobed leaves which late in the autumn turn dull orange or orange and red. The flowers are an inch in diameter in few-flowered clusters, and very conspicuous from the large, deep rose-colored anthers of the twenty stamens. The fruit, which is often nearly an inch in diameter, is nearly globose, bright blue-green covered with a glaucous bloom, and five-angled at the end of September; later it loses its angles, turns orange color and finally becomes dark purplish red and very lustrous. Both when it is in flower and when the fruit is red this is a very ornamental plant.

Crataegus aprica. There are two plants of this species in this collection. They are interesting as representing a peculiar group of the genus (*Flavae*) which is confined to the southeastern United States. *C. aprica* is a tree sometimes twenty feet high in the low valleys of the southern Appalachian Mountains which are its home. This plant is attractive just now for the small leaves have turned bright orange and red and the branches are thickly covered with its small clusters of dull orange-red fruits. These plants were raised from seed presented to the Arboretum in 1876 by Asa Gray as *Crataegus coccinea*, the name by which most red-fruited American Hawthorns were known until the systematic study of the genus was undertaken some twenty years ago.

Crataegus coccinioides. There is a good plant of this Thorn in this collection. It is a round-topped densely branched tree with broad, thin, dark green, ovate, lobed leaves from two to three inches long which are now bright orange and scarlet. The large flowers are produced in very compact, nearly globose, from five- to seven-flowered clusters and are conspicuous from the large size of the deep rose-colored anthers of the twenty stamens. The fruit which is a good deal covered by the foliage, ripens and falls gradually during the month of October and is subglobose, nearly an inch in diameter, dark crimson, very lustrous and erect on short pedicels in compact clusters. This handsome

plant is a native of the region in the neighborhood of St. Louis. The compact flower and fruit clusters readily distinguish it from allied species.

Crataegus succulenta. This is a good representative of a peculiar group of Thorns (*Tomentosae*), distinguished from the other groups by the deep longitudinal cavities on the inner face of the nutlets of the fruit. The leaves of this Thorn are thick, lustrous, dark green, elliptic in outline, lobed only above the middle, and not brilliantly colored in the autumn. The flowers with twenty stamens and small rose-colored anthers hang on long slender stems in many-flowered clusters. The fruit is two-thirds of an inch in diameter, scarlet and very lustrous, and its beauty is increased by the contrast of color with the dark green leaves among which it is suspended.

Crataegus fecunda. This is also a native of the St. Louis region and is a good representative of the great *Crus-galli* Group of which the well-known Cockspur Thorn is the type. *C. fecunda* is a large, round-topped tree with lustrous leaves broadest at the apex, small flowers with rose-colored anthers in many-flowered clusters, and abundant orange-red fruits which droop on slender stems. Other plants in this collection to which attention is called are *C. prunifolia*, *C. Douglasii*, the black-fruited species of the Puget Sound region, of which there is a large specimen here, *C. rivularis* from the southern Rocky Mountain region, a smaller tree also with black fruit, *C. arkansana*, *C. Arnoldiana*, *C. Dawsoniana*, and forms of the European *C. oxyacantha*.

Crataegus on Peter's Hill. A large number of Thorns in the Peter's Hill Collection have flowered this year and several of them are now bearing good crops of fruit. Of special interest just now are the plants of the *Intricatae* and *Uniflorae* Groups, many of which are covered with fruit. These groups are of particular interest to gardeners for, with a few exceptions, they are small shrubs and begin to bloom when only a few years old. The flowers which usually open later than those of most of the Thorns, are large and showy with either yellow or rose-colored anthers. The fruit, which is large and usually sub-globose, is on different individuals scarlet, crimson, orange-color, green or yellow, and the leaves of most of the species turn late in October to beautiful shades of orange, red or scarlet. This group of shrubs is at the eastern base of Peter's Hill on the lower side of the drive and near a large White Oak. Some of the species which are most attractive at this time are *C. fruticosa*, *C. Bissellii*, *C. Peckii*, *C. Smithii*, *C. foetida*, *C. modesta*, *C. nemoralis*, *C. cuprea*, *C. intricata*, *C. Boyntonii* and *C. Buckleyi*. Long overlooked by botanists, these little plants have not yet found the place in gardens which, when better known, they are destined to occupy.

Crataegus punctata. There is a group of this Thorn on the southern side of the Overlook on Bussey Hill which well shows the variation in the color of the fruit on different individuals of this species. On some of these plants the fruit is red, and on others yellow, orange color or

rose. *C. punctata* is one of the largest and most widely and generally distributed of the species of the eastern states where it is often a tree thirty feet tall with wide-spreading branches which form a flat or round-topped head of great beauty. This species, which has been known for more than a century and is often cultivated, is peculiar in the fact that some individuals have flowers with rose-colored anthers and others have flowers with yellow anthers, and that the plants with the rose-colored anthers produce red fruit while those with yellow anthers produce yellow fruit.

Crataegus cordata. Near the group of *C. punctata* on the Bussey Hill Overlook are two large plants of *C. cordata* or the Washington Thorn, as it is sometimes called. This is a narrow tree sometimes thirty feet tall with erect branches and small nearly triangular lustrous leaves which are now beginning to turn bright scarlet. The small globose fruits are also turning scarlet and will remain on the branches until spring with little loss of beauty. This is the latest of all the species of *Crataegus* in the Arboretum to flower. The only drawback to this handsome little tree is found in the brittleness of the branches which are often broken by high winds. A century ago it appears to have been frequently used in the middle states as a hedge plant.

An autumn-flowering Lilac. Lilac flowers in October are not common, but *Syringa microphylla*, which flowered the middle of June, began to bloom again six weeks ago and is still covered with flowers. It is a native of north central China and is a hardy, free-growing shrub with small leaves and small, pale rose-colored, fragrant flowers in small narrow clusters. It is far from being one of the handsomest of the Lilacs, but if it keeps up the habit of flowering for a second time in autumn it will be at least interesting even if other Lilacs are more beautiful.

Stuartia pseudocamellia. This small Japanese tree is of interest at this time on account of the dark bronze-purple color of its autumn leaves which is unlike that of any other plant in the Arboretum. It should be grown, too, for its pure white cup-shaped flowers which resemble those of a single-flowered *Camellia*. This *Stuartia* is a narrow tree with slender erect branches and pale gray, smooth bark which separates in large thin plates. It grows slowly but is perfectly hardy. Two specimens can be seen on the upper side of Azalea Path.

Enkianthus perulatus, or *japonicus* as it is perhaps better known, is unusually handsome this year, equalling and even surpassing the Highbush Blueberry (*Vaccinium corymbosum*) in the brilliant scarlet of its autumn leaves. Unlike *Enkianthus campanulata* it is shrubby in habit and forms a dense broad bush. The white bell-shaped flowers are attractive, but in the Arboretum the plants have not produced seeds, and this *Enkianthus* is therefore rare in American gardens. It is found, however, in all Japanese gardens where it is grown for its autumn colors and where it is usually cut into dense balls. The best collection of *Enkianthus* is on the lower side of Azalea Path, where several species are flourishing.

ARNOLD ARBORETUM

HARVARD UNIVERSITY



BULLETIN

OF

POPULAR INFORMATION

JAMAICA PLAIN, MASS.

NOVEMBER 6, 1917

Broad-leaved Evergreens. The number of varieties of these plants which can be successfully grown in eastern Massachusetts is very small, and the botanical explorations of the last quarter of a century have made only a few additions to the list. Moreover, it is not probable that further exploration will greatly increase the number of these plants which can be grown in this climate, and probably the only hope of increasing it is in the production of new races of hardy Rhododendrons. A large portion of the broad-leaved evergreens which are hardy in the northern states belong to the Heath Family and cannot grow in soil impregnated with lime, so that the number of these plants available for the gardens of the middle west is confined to species of only three or four genera. Of the plants introduced from China only one or two Rhododendrons, four Barberries, a Viburnum, and possibly a Gaultheria can be kept alive here in the open ground, and the permanent value of some of them is not yet assured.

Evergreen Barberries. The four species of evergreen Barberries which are growing in the Arboretum are *Berberis Julianae*, *B. verruculosa*, *B. Gagnepainii*, *B. Sargentiana*. The last is the least hardy of these four plants and it can be kept alive here only in exceptionally sheltered positions, and, judging by our experience with it in the Arboretum, it will never become a good garden plant in this climate. Of *B. Julianae* there are a number of plants here in exposed positions where they have been growing for several years and have not suffered from heat or cold. It is a tall shrub with pale branches and spines, thick, dark green leaves, clusters of yellow flowers and blue-black

fruit. The Arboretum plants flowered for the first time last spring and have not yet produced fruit. *B. Gagnepainii* is also a tall shrub, with yellow-gray branchlets, long slender spines and narrow spiny leaves. The small flowers are in from three- to eight-flowered clusters and are followed by pear-shaped, bluish black fruit one-third of an inch long. This Barberry has flowered and fruited in the Arboretum this year for the first time. *B. verruculosa* is a dwarf spreading plant sometimes three feet high and broad, with slender, semipendent branches covered with many long slender spines and small, remotely spiny, toothed leaves dark green and very lustrous on the upper surface and silvery white below. The flowers are pale yellow and solitary or in pairs, and the fruit is about half an inch long and dark violet color or nearly black. This handsome little plant flowers irregularly through the summer and early autumn and has not yet ripened its fruit in the Arboretum. These three Chinese evergreen Barberries are with the other Chinese plants on the southern slope of Bussey Hill where they have been growing for three or four years in an exposed position.

Mahonias, as Barberries with pinnate leaves are now generally called, are not very hardy here with the exception of the Rocky Mountain *M. repens* which is a good plant in this climate and soon spreads by underground stems into broad clusters. The handsomer *M. Aquifolium*, the Oregon Grape of the northwestern part of the country, lives in sheltered positions, but many of the leaves are usually injured by the cold. *M. pinnata* and *M. japonica* generally live here but cannot be recommended for general planting. They can be seen on Hickory Path near Centre Street.

Viburnum rhytidophyllum. This plant attracted a good deal of attention when it was first raised from seeds collected by Wilson in China, but in eastern Massachusetts it is hardy only in sheltered positions and usually suffers more or less every winter. In the neighborhood of Philadelphia, however, it appears to be perfectly hardy and specimens there are already fully ten feet high. It is a large shrub with stout erect branches and tomentose branchlets, and large dark brown leaves lustrous and deeply wrinkled on the upper surface, and covered below with a thick coat of gray or yellowish felt. The flowers are in compact terminal clusters which are formed in the autumn and are conspicuous during the winter, and the fruit is about a third of an inch long, at first bright red when fully grown and finally black and very lustrous. There is a plant of this *Viburnum* on Hickory Path near Centre Street, and another on the upper side of Azalea Path on which the flower-buds can now be seen.

Kalmias. The most generally satisfactory broad-leaved evergreen which can be grown in this part of the country is the Mountain Laurel (*Kalmia latifolia*) which is one of the handsomest plants of the North American flora. There are forms of the Mountain Laurel with white, pink and red flowers and there are some monstrous forms which are more curious than beautiful. Two dwarf species, *Kalmia angustifolia*, the well-known Sheep Laurel of northern pastures, and *K. carolina* from the southern mountains, although not often cultivated, deserve a

place in the garden. *K. polifolia*, or *glauca*, is hardy, but not easy to establish in gardens. The *Kalmias*, like the *Rhododendrons* and all plants of the Heath Family, cannot grow where there is lime in the soil.

Rhododendrons. A large number of the species and hybrids of *Rhododendrons* are now cultivated in California and in some parts of Europe, but only a few of them can be grown in the open ground in the eastern United States, and the region here where any of these plants thrive is not large, for it is too cold for *Rhododendrons* north of Massachusetts and too hot for them south of Pennsylvania except on the slopes of the Appalachian Mountains. Only the species of eastern North America, *R. maximum*, *R. catawbiense*, *R. carolinianum* and *R. minus*, and *R. Smirnowii* of the Caucasus, *R. brachycarpum* of the high mountains of Japan, and *R. micranthum* from western and north central China are perfectly hardy here. This last is a small plant with small leaves and small compact clusters of white flowers and looks more like a *Ledum* than a *Rhododendron*. Of the sixty odd species of Chinese *Rhododendrons* raised at the Arboretum from seed collected by Wilson this is the only one that is perfectly hardy here, although *R. discolor* can be kept alive in sheltered positions at least for a few years. Two little European *Rhododendrons*, *R. ferrugineum* and *R. hirsutum* live here but the plants are generally short-lived and not really satisfactory. Most of the *Rhododendrons* cultivated in this part of the country are hybrids of *R. catawbiense*, but only a very few of the great number of these hybrids which have been raised in Europe are really hardy here. There are hybrids, too, growing in the Arboretum of *R. Metternichii*, of *R. Smirnowii*, of *R. maximum*, of *R. minus* and of the European species which are hardy. There is still much to be accomplished in the gardens of eastern America by the breeders of hardy *Rhododendrons*.

Hollies. *Ilex opaca*, the widely distributed, red-fruited species of eastern North America is the only broad-leaved evergreen which is a tree in this climate. *Ilex opaca* seems able to flourish under the conditions of city life and to be little injured by the smoke from bituminous coal fires which are so injurious to most evergreen plants. That it is a long-lived tree is shown by the specimens planted by Washington about 1785 at Mt. Vernon which are still in perfect health and among the most interesting of the trees planted by him. *Ilex glabra* is another excellent broad-leaved evergreen for the decoration of New England gardens. It is a broad round-topped shrub with small lustrous leaves and small black fruit a good deal hidden by the foliage, and is a native of the coast region from New Hampshire to Texas. A good mass of these shrubs can be seen on the right hand side of the Hemlock Hill Drive opposite the Laurel plantation. Two Japanese evergreen Hollies can be grown here, *Ilex crenata* and *I. pedunculosa*. The former is a small bushy tree or small shrub with small finely toothed leaves and small black fruit borne on such small stems that it is hidden by the leaves. There are forms of this plant with larger and with smaller leaves, and the small-leaved form (var. *microphylla*), on which the leaves are not more than half an inch long, is the hardier. Several

large plants can be seen on Azalea Path. Of *Ilex pedunculosa* there are only small specimens in the Arboretum, where they can be seen on Hickory Path near Centre Street where they have been growing for several years. In Japan this is a small tree sometimes twenty or thirty feet tall, or more often a shrub. The leaves resemble in shape those of our Wild Cherry, and the handsome red fruit is borne on long stalks and is very ornamental.

Andromedas. *Andromeda*, or as it is often called *Pieris floribunda*, is one of the handsomest of the broad-leaved evergreen shrubs which are perfectly hardy in this climate. It is a round-topped shrub occasionally eight or ten feet across and four or five feet high, with small, pointed, dark green leaves, and short terminal clusters of white bell-shaped flowers. The flower-buds, which are fully grown in the autumn, are conspicuous and ornamental during the winter. This southern Appalachian shrub is an old inhabitant of gardens and is still much propagated by nurserymen. The related Japanese species, *Andromeda japonica*, is sometimes a small tree and has more lustrous leaves and larger flowers in larger clusters. The plant is hardy, but the flowers, which open early, are often injured by spring frosts. The so-called Bog Rosemarys, *Andromeda polifolia* and *A. glaucophyllo*, although naturally swamp plants, can be grown in dry soil and are attractive small shrubs with small pale leaves and clustered white or pink flowers.

Chamaedaphne calyculata. This, the so-called Leather Leaf, is another native small plant which can be successfully grown in dry ground. The small white flowers are in the axils of the upper leaves and are not very conspicuous, and as an ornamental plant the Leather Leaf is not as attractive as several of the smaller shrubs of the Heath Family. There is also a plant of the dwarf form in the Shrub Collection (var. *minor*).

The Box Huckleberry. Among the easily grown and perfectly hardy evergreen plants of the Heath Family none is perhaps more beautiful than the Box Huckleberry (*Gaylussacia brachycera*) with its small, lustrous leaves which become the color of old Spanish leather in the autumn, small white flowers and blue fruits. The prostrate stems spread into broad mats only a few inches high, and although the plant grows naturally in the shade of Oak woods it thrives in full sunshine. This is one of the rarest plants in North America and is now known to grow naturally in only one place in Pennsylvania.

Blueberries. A few of the evergreen *Vacciniums* can be grown in this climate, including the Cowberry (*V. Vitis-Idaea*) and its variety *minus*, low plants with tufted creeping stems, small pink or white flowers and dark red berries. The two Cranberries, *Vaccinium Oxycoccus* and *V. macrocarpon*, although inhabitants of swamps, will also grow in dry ground and are beautiful plants.

The only other broad-leaved evergreens which are perfectly hardy here are the Leucothoes, the Bear Berry, the Gaultherias, the Ledums, *Leiophyllums*, the *Pachystimas*, *Evonymus radicans* and *Vinca minor*.

The Bulletins for 1917 will now be discontinued.

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